Creation/Evolution

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About this issue and the next . . .

In this issue, we feature a mixture of articles on both science and philosophy. David Milne leads off by responding to an important but outrageously flawed argument that creationists use for a young earth. Ronald Pine follows with an explanation of why creationists who have degrees in science aren't necessarily scientists. He supports his points by providing standards for judging what is science and what is pseudoscience. And Robert Price, always enjoyed for his explorations into the theology of creationism, now shows how creationism is merely a branch of fundamentalist apologetics.

Also in this issue, we carry over some important discussions from our last issue. Astronomer Steven Shore elaborates on the points made by Frank Awbrey about the creationist space dust arguments. Creationist Norman Geisler comes back with a rebuttal to earlier responses to his article on design, and Frederick Edwords follows with a counter-rebuttal. The "Letters to the Editor" column is particularly lively, since many of the writers not only respond to last issue's articles but to some of the letters as well.

This sort of exchange will have to take a hiatus in Issue XV, however, which will be devoted entirely to the scientific examination of creationist claims that human and dinosaur footprints appear side-by-side in the prehistoric limestone of the Paluxy River in Texas. *Creation/Evolution* financed a team of four scientists to measure and study the prints. They explored the area in 1982 and 1983 and even observed the creationists at work uncovering the prints. Since so many readers have been eagerly awaiting the results of this study, Issue XV is already in preparation so that it can be rushed to you. We know you'll enjoy it.

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Creationists, Population Growth, Bunnies, and the Great Pyramid

David H. Milne

In an effort to prove that the Earth is not very old, creationist Henry M. Morris has devised a calculation that is based upon the human population explosion. Using the equation $P_n = P(1+r)^n$, he shows that two individuals present on the Earth in 4300 BC (presumably Adam and Eve) could initiate sustained exponential population growth sufficient to produce the entire estimated global population of year 1800 AD.[1] Values used by Morris in this equation are P = 2 (initial population of Earth), P_n = one billion (estimated population of the Earth in 1800 AD), and r = 0.0033 (1/3 of 1% increase per year; estimated per capita global growth rate, 1650 to 1800 AD). He solves for n, obtaining as an answer the value n = 6100 years (prior to 1800 AD). By this calculation, he shows that it is mathematically possible for two individuals who lived about 6300 years ago to have given rise to the entire modern population of the Earth. Although he says nothing about the age of the Earth in this derivation, he cites this calculation in other works as evidence that the Earth itself is not very old.[2, 3, 4] Other creationists offer their own version of this calculation, using similar logic and slightly different numbers.[6] Even Morris himself tries different numbers in another work.[5]

The second half of this particular creationist argument is that if humankind had been reproducing at even a miniscule rate (say, r = 0.0001) for a million years or more, the entire solar system would now be crammed with human bodies.[5, 6] Therefore, say the creationists, population growth statistics support the view that human beings (and by implication the Earth itself) appeared only a few thousand years ago, while contradicting any possibility that people (and the Earth) have existed for much longer. This creationist argument depends upon the assumption that human numbers must necessarily have been increasing throughout all of a necessarily brief human history, while the evolutionary view assumes that populations of humans and their earlier ancestors have had a zero growth rate (i.e., r = 0) over most of their history.

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To understand why the creationists are wrong, consider this example. Suppose that a creationist were studying snowshoe hares, somewhere in Canada in the early 1930's. At that time, the bunnies were multiplying at a per capita rate of about r = 0.57 (57% per year).[7] If that was all that our biologist knew about the rabbits' history and biology, the Morris calculation would enable him to determine that the first two snowshoe hares of all time appeared on Earth in late 1885, during the Cleveland Administration.[8] Not only that, but the Morris calculation applied to minks, muskrats, foxes, and lynxes (which were also multiplying at that time) would also place the date of the creation of the Earth and life in the late 1800's. If one accepts that the Cleveland Administration was not the perpetrator of it all, then where are the errors? Here, two major mistakes are involved. First, the creationist in this instance did not use all of the known facts in arriving at his conclusion. Second, he assumed that the entire rabbit history was similar to that of those last few years that he was able to observe. In fact, the hares (and their predators) are known to cycle in abundance. In 1933 their numbers were increasing, but only as the latest in a series of roller coaster ups and downs that can be traced clear back into the 1700's. Over the long haul, r = 0 for the bunnies, a fact that would not be evident to an observer who watched them only during the early 30's.

The Morris calculation using human population statistics contains both elements of the "bunny blunder." Facts are ignored, and the assumption is made that all of human history prior to 1650 was characterized by growth like that seen from 1650 to 1800.

Unlike the bunny situation, we have no real knowledge of the true global human population size in medieval and earlier times. Almost all estimates are based on measures of carrying capacities of agricultural land and hunter/gatherer ranges, estimates of labor forces needed to construct various public works, and other indirect measures of population sizes.[9] These estimates, many of which give world populations of about 1/4 billion at the time of Christ, are among the facts ignored by Morris.[1] Others include the fact that humans must be a glaring exception to the usual situation in nature, if humans have experienced a high positive value of r throughout Earth history while all other species have had growth rates of approximately zero. Plagues and famines, also ignored by creationists, have decimated human populations with dreadful regularity over the ages. Where they have exerted their effects, population growth could not possibly have been rapid or even positive. When bubonic plague entered Europe during the mid-1300's, for example, nearly a quarter of the entire population died within one year, and European population actually declined for a century or two thereafter.[10] Such episodes have been so common throughout human history that they can be considered to be the rule, rather than exceptional occurrences.[11] Finally, even the limited

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numerical data, which are not favorable to the creationists' argument, are ignored. In St. Botolph, a parish of London from which unusually complete burial and christening records have survived to the present day, the death rate slightly overshadowed the birth rate between 1558 and 1625 AD, and drastically overshadowed it during the plague years 1563, 1593, 1603 and 1625.[12] Thus, r was always slightly negative during this period, and was drastically negative during the epidemic years.

Thus, although the "facts" in the human case are not as firm as in that of the snowshoe hares, nevertheless all of them point toward the same conclusion. That is, human population growth was probably negative, zero or near zero over much of times past. Only by ignoring these contrary indications and by assuming that the growth rate of the pre-Industrial Revolution years was somehow typical of all of human history can creationists arrive at the conclusion that two human individuals living in 4300 BC could in actual reality have produced the entire world population of today.

In addition to committing the "bunny blunder" in their calculation, creationists make other errors in their use of population statistics as an indicator of the age of the Earth. For example, there is no scientific evidence that world population once consisted of only two people (or even a very few). And even if it could be shown that there were only two (or a few) people present on the Earth a few thousand years ago, this is not the same as showing that these were the first people of all time. They could have been the survivors of a previous cycle (or a thousand previous cycles) of population boom followed by epidemic bust. And even if they *were* the first people of all time, this still says nothing about the age of the Earth. The Earth could not be younger than those individuals, but how much older it is, whether it be a few days or 4 billion years, must be demonstrated from other evidence.

As if these fatal flaws were not enough, Morris's calculation has ridiculous implications. For example, if we assume for the moment that human numbers really did grow exponentially at a per capita rate of $r = 0.0033$, starting with two people in 4300 BC, then we can calculate the world population of year 2500 BC. By Morris's calculation, that number is 750 individuals. If Egypt, with about 1% of the Earth's land surface area, also had 1% of its population, then about eight people must have lived in Egypt at that time. However, the Great Pyramid of the Egyptian king Cheops was built in about 2500 BC.[13] If the creationists are right, then the Pyramid was built by eight people. In fact, suppose that the entire population of the Earth lived in Egypt at that time. Half of the 750 souls were women (who I don't think worked on the Pyramid); half of the males were children (ditto) and a few exalted characters (Cheops himself and his assorted advisors) undoubtedly convinced the others that nobility should not have to haul heavy limestone blocks. That leaves about 150 able-bodied men to quarry 2,300,000 blocks (ranging from

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2½ to 50 tons in weight), haul them to the construction site and raise the 480-foot Pyramid. Does anyone who has seen this colossal monument believe that 150 men could have built it? Yet that is what Morris, through the magic of his calculation, must boldly assert.

World history prior to 2500 BC, in the Morris scenario, becomes even more remarkable. Six pyramids, some comparable in size to the Great Pyramid, were built at nearby sites within the previous 200-year period (as were numerous accessory causeways, temples, etc.).[14] The parents and grandparents of the 750 people at the Great Pyramid site must have built them, at the rate of one every 33 years. Their numbers (which, recall, constituted the entire human population of the Earth) were fewer then—only about 300-400 souls—and they were distracted by the need to perform a fast migratory quick-step over to Mesopotamia to build (and abandon) a number of fortified towns that appeared at about that time. The action was even more frenzied in earlier centuries. World population in 3600 BC, as calculated by the Morris equation, was 20 people. A century earlier, in 3700 BC, it was 14 people. And a century earlier than that, it was 10 people. So, in the Morris scenario, a world population of one or two dozen people must have rushed back and forth between Crete, Mesopotamia, the Indus River valley, and other sites of ancient civilization, energetically building and abandoning enough cities, irrigation works, monuments and other artifacts to leave us with the mistaken impression that millions of people populated the ancient world.

To summarize, then, the creationist calculation of the age of the Earth, based upon population statistics, has the following flaws:

a) it ignores many indications that human per capita growth rates were zero or negative throughout much of human history;
b) it assumes that growth rates characteristic of the later pre- and early industrial world were characteristic of human populations throughout all of preceding history;
c) it assumes, without evidence, that the entire world population once consisted of two (or a few) individuals;
d) It assumes that the Earth is only as old as (or slightly older than) its human occupants;
e) it predicts unrealistically small human population sizes for ancient historical times.

In conclusion, it seems appropriate to recall Morris's statement, "The burden of proof is altogether on evolutionists if they wish to promote some other population model."[1] It would seem, however, that it is the creationists who need to explain why their model, based as it is upon erroneous or unsupportable assumptions and producing laughable perspectives on ancient history, should be accepted in preference to an evolutionary view that fits the facts.

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8. Assume 12×10^8 acres of suitable hare habitat in Canada and twice that in the USSR for a total of 36×10^8 acres (half of both countries). Assume 1 hare/acre for $P_n = 36 \times 10^8$ hares. Solve the Morris equation for n, using P = 2 and r = 0.57. Answer: n = 47.2 years (prior to 1933). Thus, late 1885 is the snowshoe hare creation date. Suppose the hares (and all other rabbit species) *evolved* from the first two created individuals of the "rabbit kind." Assume 10 times as many rabbits, world wide, as there are hares. Again solve the Morris equation, using $P_n = 36 \times 10^9$. The answer: n = 52.3 years, and the rabbit creation date is mid-1880.
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But Some of Them *Are* Scientists, Aren't They?

Ronald H. Pine

"Scientific" creationists tend to call themselves scientists, and many do actually have degrees in engineering or in some actual field of science. The Creation Research Society, an organization that probably most qualified scientific creationists belong to regardless of their other organizational or institutional ties, requires that its members have at least a master's degree in "science" (apparently including engineering, medicine, and other things). Some of these creationists are employed as science teachers in high schools or in accredited colleges and universities, and may even have Ph.D. degrees. And yet I call them pseudoscientists! How dare me.

Scientists and Nonscientists Doing Nonscience

Making definitions is making distinctions. I distinguish between *engineer* and *scientist*, and among *training*, *profession*, *teaching*, and *the game actually played*. A scientist is someone who plays the game of science. He or she must, of course, play by the rules or it is some other game. There's nothing wrong with playing other games, since many are equally worthwhile or perhaps even more so, but if some other game is being played, it shouldn't be called "science."

Viewing science as a game is useful. For, like basketball, football, ping-pong, or chess, science has definite rules of play. Therefore, just as it is not basketball to play by rules other than those for the game of basketball, so it is not science to play by rules other than those for the game of science.

For example, if a player on a basketball court suddenly grabs the ball, tucks it under his arm, runs to the end of the court, spikes the ball, and then claims he's made a touchdown, it would be obvious to everyone that the

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player is trying to play a game other than basketball. The fact that the player has been trained to play basketball, may have earned degrees in physical education and has, at various times, played basketball flawlessly, would be regarded as irrelevant to whatever claim he might make that he is, at this moment, playing basketball. If the practice of trying to play football on the basketball court had become a fad of sorts and the player could point to other players who had done the same thing on other courts, this would also be irrelevant. One supposes that if the disruptive athletes (a small minority and most of them not basketball specialists) banded together and asked that "basketballish footballism" be given equal time with conventional basketball in all P.E. courses in the public schools, the public would not stand for it.

Unfortunately, the rules of the game called science are not as well-known to the public as are the rules of basketball. So, when the scientific creationists play their non-science game and then call it "science," many people don't know the difference.

Many people also are not aware that, as with basketball, in order to play the game of science, one need not have a degree in a technical field. A high school student engaged in a research project on the nature of nature and following the rule of the game is being a scientist. The only thing that distinguishes the scientist from other people is the game being played, just as the only thing that distinguishes a chess or basketball player from other people is the game being played.

A person may have a degree in chemistry and not be a chemist. My wife, for example, has a degree in chemistry, but is a computer programmer. This is because she performs the role of computer programmer, rather than the role of chemist. Likewise, a person may have a degree in some field of science, but play the role of pseudoscientist.

I have many roles. I am an uncle, son, nephew, father, husband, son-in-law, brother-in-law, scientist, teacher, public speaker, voter, taxpayer, consumer, and any number of other things. Each of us wears more than several hats, and, naturally, Sir Isaac Newton did as well. Two of the roles that Newton functioned in were scientist (player of the science game) and theologian (player of the theology game). Some of the time Newton felt like playing science, and some of the time he felt like playing theology. Fortunately for his science and also for his theology, Sir Isaac Newton always knew which game he was playing and never got the two mixed up.

Probably most scientific creationists have never played the game of science. This is because so many seem to be practitioners in fields like engineering, medicine, or veterinary medicine. Such people don't generally function as scientists but as "technologists"—they utilize known principles of science in attempts to solve certain practical problems such as how to keep a weakened dam from bursting, how to cut out a cancer, or how to prevent

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distempter. Architects, plumbers, and electricians, among others, also utilize principles that have been discovered by scientists. But the game of science is the trying to increase knowledge and understanding of the fundamental nature of nature—playing by the rules, of course.

When I say that a particular endeavor is not science or is not scientific, or that some person is not a scientist, this isn't a putdown. I don't place science by itself at the top of some hierarchy of worthwhile activities. Beethoven, Jesse Owens, George Washington, and John the Baptist were not scientists, but stating this no more disparages them than would saying that they were not oranges or tangerines.

Some nonscientific pursuits, such as medicine and engineering, require more than the usual amount of training in the things that scientists have found out. Many people who have degrees in engineering, medicine, veterinary medicine, and so on do play the game of science on occasion or even a great deal of the time. To the extent that they do this, they are scientists. (To the extent that a person trained in accounting does science, he too is a scientist.) Some people trained in engineering or medicine become full-time scientific researchers. Most, however, are "technologists" (practitioners).

A person who teaches "science" (that is, the things discovered by means of science) at the elementary, secondary, or college level may, like anyone else, either play or not play the "doing science" game. Most don't play it (no criticism intended). A science teacher *per se* is not the same thing as a scientist *per se*, just as a history teacher is not the same thing as an historian (although a single person may be both). An historian figures things out about history that no one knew before, and a history teacher teaches those things discovered by the historian. They are two different games.

Possession of a master's degree in "science" is no guarantee that a person has ever actually played the game. For example, when I received my master's degree in zoology from the University of Michigan I had, as yet, never really done any research. I had merely taken thirty hours of graduate courses. Many people with master's degrees, however, have written a thesis which should, ideally, present the results of an original scientific investigation. Some theses actually do this, while others are mere compilations of pre-existing information.

The Ph.D. degree in a scientific field is not to be given by an accredited institution unless the recipient has demonstrated ability to play the game by completing a research project and writing it up in the form of a *dissertation*. We can say, therefore, that a scientific creationist who has a Ph.D. in a *bona fide* natural science from an accredited institution of higher learning has, for a while at least, been a scientist. This does not mean, however, that anything this person chooses to do thereafter in the name of science will necessarily be such.

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Some scientific creationists have never been scientists. Some were actual scientists for a period of time, but haven't been since. Others may play the game of science when they're working on their speciality, and even do it well enough to make a living at it, and then do pseudoscience in their off hours. To the extent that they do the latter, they are pseudoscientsts.

What Science Is and Isn't

But what is it that I refer to as "the game of science"? How is it played and what distinguishes it from other games? And most importantly, why is it that scientific creationism doesn't qualify as a way of playing this game?

I define science as a particular set of practices calculated to help us learn new things about the natural world. The key word here is *practices*. The thing that determines whether a statement is a *scientific* one is not whether it is true or false, but *the means by which the statement was arrived at.*

At one time, science, like the game of basketball, did not exist. The ancient Greeks played around with some ideas that were sort of embryonically scientific in nature but the Greeks mostly operated off the tops of their heads and did not take the study of *nature* (that is, the study of the actual rocks, plants, and animals around them) seriously. There were some partial exceptions to this, like Aristotle, but for the most part Greeks didn't make actual *observations* to test their ideas.

During the period of Roman domination, science was usually regarded as unimportant because the Romans were more interested in amusement, money, and power—that is, in "practical" things—than they were in philosophical or theoretical matters. There was little science in the Middle Ages because it was usually thought that everything was known. The Bible, and the works of Aristotle, Ptolemy, and Galen were believed to contain all conceivable knowledge and thus there was no recognized need for inquiry into the workings of nature. The answer to the question, "How did things become as they are?" was always, "Things are the way they are because that's the way God wanted them to be so he made them that way." Although this answer may be the correct one, it tends to have a chilling effect on scientific inquiry.

During the Renaissance, the rules for playing the game of science were laid down. Some of these are:

1. Science does not respect authority. It makes no difference whether the authority is the Bible, the Talmud, the Koran, the Book of Mormon, the Bhagavad-Gita, the Himalayan Book of the Dead, the Egyptian Book of the Dead, a papal bull, or a proclamation of an ayatollah. This may be impious,

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sinful, and *wrong*, in any sense of the word, but that's the way the game is played.

2. Science *does* respect data—data derived from the *direct* study of nature (and only nature) itself. Because science, by means of observation and experiment, asks questions only of the natural world, it is totally incapable of investigating the nonnatural, extranatural, or supernatural, and thus can make no statements about the existence, nonexistence, or nature of supernatural beings or phenomena. Any statement which *does* deal with such matters may be true but is not science. It is, rather, philosophy, theology, or what have you. Thus any statement concerning the existence, nonexistence, or nature of a creator or creators is *not science by definition and has no place in scientific discussion or in science classrooms.* This is not to say that such statements cannot be dealt with elsewhere in a school system, such as, say, in a class in comparative religion.

3. Because science cannot deal with the supernatural, it is forced to function *as if there is no such thing as a supernatural*—in other words, it totally ignores statements about the supernatural because they have no meaning in the language of science. This is a different thing from saying that science denies the existence of the supernatural—for this science cannot do. At the beginning of and throughout a scientific endeavor, all that is supernatural is excluded and thus it is not surprising that at the end of a scientific (as opposed to a pseudoscientific) investigation, no outlines of a creator, angels, devils, or demons appear. Because of the fact that supernatural considerations are excluded from science and therefore do not appear, there is a tight tautology that has, incredibly, been interpreted by some—including some scientists—as some sort of proof of the non-existence of gods, and other things. Equally incredibly, some are disturbed by the tautology, feel somehow that in "true" science their own particular view of a god or gods must emerge (even though this has been made impossible), and so they insert their supernatural being or beings somewhere in their equations (usually by sleight of hand by which even they are fooled) and then triumphantly "discover" them there.

Because the scientific endeavor ignores the supernatural, it refuses to let supernatural explanations put up brick walls which stop inquiry.

The scientist asks, "Why do certain kinds of living things (such as, say, cows, sheep, and goats) resemble each other the way they do?" The pseudoscientist may answer, "They resemble each other the way they do because they have a common creator and when the creator made them, he utilized the artistic convention of variation on a theme." Now this statement may be *true* but it is not a *scientific* one. That is, it is not a statement arrived at by pure study of natural phenomena and with no admixture of philosophy or theology, as it does, obviously, make an assertion about the nature and

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proclivities of a supernatural entity. To the scientist's way of thinking, the pseudoscientist's explanation simply amounts to "The animals are the way they are because God wanted them that way" which in turn sounds very much like, "That's just the way it is, take it or leave it." If the scientist accepts the answer, "That's just the way God wanted it," then this is acquiescing to a brick wall being put across the path of inquiry. The scientist can then either walk away and go play golf or something or ask another question (which could in turn be cut off by another pseudoscientific explanation). Instead, any scientist worthy of the name will forge right ahead, damn the torpedos, ignore the supernatural explanation, and come up with a *scientific* one such as, say, "These animals are similar because they evolved from a common ancestor." This explanation may be wrong, but it has the potential at least of becoming an accepted scientific one because it can be tested on the basis of a study of nature.

Rightly or wrongly, then, the overwhelming majority of scientists have concluded that of the possible explanations which have the potential of becoming accepted *scientific* ones, the evolutionary one seems best. The supernatural one may be right but there's no way to get there from here. Like it or not, this is the way science works. If you don't like it, then you are anti-science and that's fine with me so long as you call what you are by its proper name.

4. Another characteristic of science is that it strives for objectivity. Properly done, science is supposed to include efforts to disprove a "favored hypothesis." A "favored hypothesis" is the one that currently looks best to you or that appeals to you the most for some reason. A good scientist is supposed to try to think up every conceivable way to disprove a favored hypothesis and to also give every conceivable alternate hypothesis a fair shake. If a favored hypothesis proves defective somehow then that's just too bad and the scientist must abandon it. Scientists are human, of course, and realizing the ideal of objectivity is not always the easiest thing to do. Nonetheless, the ideal to be striven for must always be uppermost in one's mind if one is to do the best science. As Darwin said, "I shall endeavor to keep my mind free so as to give up any hypothesis, however much beloved, once facts are shown to be opposed to it." The extent to which Darwin approximated this ideal might be debatable but his expression of it is nonetheless eloquent.

The scientist's motivation to attempt to disprove a favored hypothesis is by no means a purely idealistic one. *If* your hypothesis is faulty and you don't discover this and then you publish it, someone else will probably come along and disprove it and then won't you look silly.

In spite of human limitations, the degree of objectivity that actually is achieved in most scientific research is a beautiful thing to behold and its contemplation is one of the greatest joys of the devotee of science. Nonethe-

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less, some pseudoscientific fundamentalist apologists simply claim that *any* degree of supposed scientific objectivity is impossible and thus by implication futile to strive for. They thus make no claim for being objective themselves (in this they are fully justified) and by the process known to psychologists as "projection," they deny that their opponents have any capabilities in this regard either.

To me, the denial of the possibility of objectivity seems cynical and reminiscent of such statements as, "moral behavior is impossible so let's not even try for it." The scientific creationist has already made up his mind about the broad outlines of reality and by a process of deduction concludes how everything must be and then says that that's the way it is. Since another way of operating is inconceivable to him, he imputes nothing more than the same deductive processes to evolutionary theorists. These creationists are convinced that all "evolutionists" had an *a priori* acceptance of an old universe and of evolution and that they have merely deductively extrapolated from that to specific cases.

The inductive method, however, was primarily responsible for the development of Darwin's and Wallace's concept of evolution, for it was a vast number of specific observations that led them to construct their synthetic explanation. The inductive nature of their thinking must be granted whether one agrees with their interpretations or not. It is said that in science no really new developments can take place without inductive thinking and this would seem to be the case.

How to Spot a Pseudoscientist

Now that we know something about what science is and is not, we can more easily tell who is playing the science game and who is not. And when someone who is not playing the science game claims that he or she is, we know that we are dealing with a pseudoscientist.

When I call someone a pseudoscientist, this doesn't mean that he or she can't also function on occasion as a scientist—or as an engineer, a politician, or whatever. But since we're focusing on the role of the pseudoscientist, rather than on some other, so as to understand scientific creationism, I'll just apply the single term.

Just what are the characteristics of pseudoscientists, whether sectarian or secular? Well, if someone claims to be a scientist but displays any of the following characteristics, you would be justified in at least suspecting that you are dealing with a pseudoscientist.

1. The individual is a layperson in the field that he or she is claiming expertise in, although he or she may not be a layperson in other disciplines.

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Theologians, physicians, veterinarians, and engineers (including hydraulic engineers) are usually laypeople, as opposed to specially trained researchers, when it comes to the field of evolutionary theory and the fields most closely tied to it—namely: paleontology, paleobotany, taxonomy, *comparative* anatomy, *comparative* physiology, ethology, ecology (the *science*—not the environmental concern), and biogeography. If you want to know something about heart trouble, you don't go to a paleontologist. If you want to know about fossils, I suggest you consult someone other than a heart specialist—or a former biochemist.

2. Pseudoscientists tend to have an unconventional view that can "explain" (and/or explain away) just about everything in the universe. They have an answer for everything and it's always the same answer.

3. They represent themselves as fighting an heroic battle for Truth against a supposedly powerful, intolerant, and rigid scientific orthodoxy.

4. They are not usually interested in a scientific subject for its own sake, but only to the extent that it seems useful to them in "proving" their grandiose explanation of things. Actual scientists who study fossils, for example, are crazy about the fossils *themselves*. They like to find fossils, they like to look at fossils, they like to feel fossils, they like to smell fossils, they like to know more and more about fossils. Their interest in fossils may be, in part, because studying them helps in developing non-grandiose hypotheses and may, just possibly, lead to a full-fledged theory someday—but such scientists also just like to get in there and grub those bones out with their own hands and carry them back in triumph to the museum, hypotheses or no hypotheses. They don't learn about fossils because they have a pro-evolutionary axe to grind. As far as they are concerned, the question of evolution was settled long ago. The kind of interest these people have is revealed in such informal discourse as, "Hey, have I told you my idea about the shape of the intestinal valve in the hybodont sharks?" The pseudoscientists are not really interested in possums, dinosaurs, lightning bugs, or fossil sponges. They are interested only in *proving something*. They generally don't get out there and get their hands dirty studying actual wild animals, plants, and fossils (apparent exceptions to this will be discussed below)—so they usually get their information from the writings of real scientists. This lack of first-hand experience with the creatures or phenomena they copy statements about is painfully obvious to any real naturalist.

5. Pseudoscientists spend most of their energies on propaganda (writing proselytizing books and pamphlets, making proselytizing movies, delivering proselytizing lectures, etc.) rather than on research. What little "research" *is* done is manifestly non-objective and superficial, and results in little, if any, new data that is useful in arriving at conclusive judgments. The "field work" is frequently designed to merely provide material for popular books and movies.

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6. If a pseudoscience is on the way to becoming a full-fledged cult with its own gospel, it probably has a living chief prophet and perhaps a few minor prophets as well. Devotees slavishly adopt the tenets of the prophet or prophets, and publish them over and over again with very little show of disagreement or dissension. This may be contrasted with the situation in actual science, where one finds constant debate, disagreement, and modification of earlier views. (The amount of publicly-expressed disagreement among the science faculty at, say, Harvard, is in marked contrast to the picture we get from Christian Heritage College and the Institute for Creation Research.) The lack of agreement and the changing hypotheses and theories in actual science are often treated by pseudoscientists as if they constituted a *weakness*. They are its strength.

Scientific Creationists Are Pseudoscientists

Study the writings of scientific creationists and judge their status for yourself.

In North America, at least, scientific creationists who have technical training are quite frequently engineers. The non-engineers who have been taught some of the things that scientists have found out, or who have themselves, on occasion, played the game of science, are usually knowledgeable only in one of the non-biological and "non-historical" sciences. Very few have had their primary technical training in biology, and I know of none who have actually conducted "hands-on" scientific studies of specimens in the fields of plant and animal classification, biogeography, or paleontology. Without exception, every single paleontologist, taxonomist, ecologist, biogeographer, comparative anatomist, botanist, mammalogist, ornithologist, herpetologist, ichthyologist, entomologist, and other invertebrate zoologist that I have ever met (and I have met and talked to hundreds, if not thousands) has been utterly convinced that the scientific evidence supports unequivocally and overwhelmingly, an old earth, an old universe, and evolution. Now I know that this doesn't necessarily make it so. I emphasize such unanimity (in my experience at least) among non-laypeople only because the scientific creationists try to make it appear as if great ages and evolution are matters of dispute and debate among informed scientists.

In general, scientific creationists are evangelical fundamentalist literalist Christians. That is to say, it is their religious belief that every statement in the Old and New Testaments is literally true. This constitutes acceptance of the most extreme form of what is known as the doctrine of biblical inerrancy. It may be that there are a few fringe members of the scientific creationist movement who are not this doctrinaire, but they apparently play no significant role in the most important groups such as the Institute for Creation

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Research, the Creation-Science Research Center, the Bible-Science Association, and the Creation Research Society. Some groups, such as the Institute for Creation Research, consist of people with technical training in engineering, medicine, or science, while others, such as the Bible-Science Association seem to be directed by people with little or no technical background. As near as I can tell, the Institute for Creation Research appears to be a group of Baptists, while the Bible-Science Association is made up of Missouri Synod Lutherans.

In order to become a member of the Creation Research Society (the scholarly society to which technically trained scientific creationists generally belong regardless of their Christian biblical literalist denomination), one must sign the following "confession of faith":

> 1. The Bible is the written Word of God, and because we believe it to be inspired thruout [*sic*], all of its assertions are historically and scientifically true in all of the original autographs. To the student of nature, this means that the account of origins in Genesis is a factual presentation of simple historical truths.
> 2. All basic types of living things, including man, were made by direct creative acts of God during Creation Week as described in Genesis. Whatever biological changes have occurred since Creation have accomplished only changes within the original created kinds.
> 3. The great Flood described in Genesis, commonly referred to as the Noachian Deluge, was an historical event, worldwide in its extent and effect.
> 4. Finally, we are an organization of Christian men [no women?] of science, who accept Jesus Christ as our Lord and Savior. The account of the Special Creation of Adam and Eve as one man and one woman, and their subsequent Fall into sin, is the basis for our belief in the necessity of a Savior for all mankind. Therefore, salvation can come only thru [*sic*] accepting Jesus Christ as our Savior.

It is quite clear by the above that in this "scientific" organization no Jew need apply.

Please contrast that "confession of faith" with the statement of Darwin quoted earlier, a statement that expresses the true spirit of science. "I shall endeavor to keep my mind free so as to give up any hypothesis, however well beloved, once facts are shown to be opposed to it." The scientific creationist, of course, does not regard his or her literalist view of biblical inerrancy as an hypothesis. Instead, to such a person, the only way of knowing anything for sure is through divine revelation (i.e., the Bible). This may or may not be so, but it isn't science.

It might seem curious that Jews, believing as they do in exactly the same Genesis as Christians, are excluded from membership in what is ostensibly a society of scholars dedicated to "proving" that Genesis is "True." If scientific evidence alone would suffice to do this, what difference would it make whether a scientist was a Genesis-believing Christian, or a Genesis-believing Jew?

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The fact is, of course, that in spite of protestations to the contrary, the real reason for believing in scientific creationism is anything but scientific. It is a specific fundamentalist doctrine. Thus, it isn't enough that a pseudoscientist claim belief in every word of the Old Testament—*he or she must do it for the right reason* or be forever kept out of the fold. The *right reason* has perhaps been best expressed by the director of the Center for Scientific Creation in Illinois, Walter Brown: "If evolution happened, then a tremendous amount of death occurred before man evolved. But if death preceded man and was not a result of Adam's sin, then sin is a fiction. If sin is a fiction, then we have no need for a Savior." (Brown, 1981)

I am sure that a much higher percentage of atheists would agree with this statement than would of Christians. It simply says that if the conclusions of science are correct, then Christianity is nonsense and should be abandoned. This is precisely the atheist position. If one has become convinced of the truth of this proposition and then sees (as many have and as many more will in the future) that the current scientific view of the universe is a compelling one, then one has no choice but to give up Christianity. Must we force believers into such a bind? Many devout Christians (including many scientists) see no difficulties for their faith in accepting the current scientific view of the universe.

That any educated person could perceive the thought and motivation of scientific creationists as being at all scientific, then, is amazing. Listen to Whitcomb and Morris in *The Genesis Flood* (1973) as they discuss ages for the earth, as arrived at by scientific means:

> Once again we emphasize that the only *certain* basis of prehistoric [*sic*] chronology must come by way of divine revelation. This revelation, in the Bible, records a Creation and subsequent universal Flood, both occurring only a few thousand years ago! And nothing in true science can possibly negate this; nor, in fact, when the data are rightly understood, does it even seem to do so. [Emphasis theirs.]

If certain scientific viewpoints differ from Whitcomb and Morris' interpretation of the Bible, then these viewpoints can't be "true science" by Whitcomb and Morris' definition of "true science" (that is, science that agrees with them). If scientific data appear to disagree with Whitcomb and Morris' interpretation of Scripture, it can only be because the data are not "rightly understood." It couldn't possibly be because Whitcomb and Morris have not "rightly understood" Scripture.

Henry M. Morris, co-author of the words quoted above, and director of the Institute for Creation Research, is indisputably the leading scientific creationist. His books and articles have provided what appears to be the original source for much of the scientific creationist doctrine and supporting apologetics. So, here are some more samples from *The Genesis Flood* of

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Whitcomb and Morris' theology and understanding of the spirit of science:

> We say, on the basis of overwhelming Biblical evidence, that every fossil man that has ever been discovered, or ever will be discovered, is a *descendant* of the *supernaturally created* Adam and Eve. This is absolutely essential to the entire edifice of Christian theology, and there can simply be no true Christianity without it. [Emphasis theirs.]

Here we see again that the only possible "true science" is science that agrees with Whitcomb and Morris, and that the only possible true theology and true Christianity are theology and Christianity that agree with Whitcomb and Morris. Lest someone still think that dispassionate examination of scientific evidence might play some role in Whitcomb and Morris' viewpoint, note the following:

> With only a few exceptions [I dispute this], American evangelicals have been willing to part company with evolutionary anthropology . . . But why? Certainly not because Christians have carefully studied the pros and cons of various theories of the origin of man and have concluded that the Biblical view is the most consistent with the "facts." No one ever arrives at a world-and-life view by such a purely inductive method. The true reason why Christians have been willing (with some exceptions, of course) to take their stand on a Biblical anthropology, in opposition to an evolutionary anthropology, is that they enjoy a vital spiritual relationship with Jesus Christ and accept His authority. . . .
>
> It has often been maintained that God has given us two revelations, one in nature and one in the Bible and that they cannot contradict each other. This is certainly correct; but when one subconsciously identifies with natural revelation his own interpretations of nature and then denounces theologians who are unwilling to mold Biblical revelation into conformity with his interpretation of nature, he is guilty of serious error. After all, special revelation supercedes natural revelation, for it is only by means of special revelation that we can interpret aright the world about us.

Conclusion

There is no reason to doubt that some scientific creationists have legitimate degrees in scientific subjects. But this fact alone, as I have shown, does not make scientific creationism scientific. A study is scientific only if it is done scientifically: that is, according to the rules of the game of science. These rules are specific, and the game itself is limited in what it covers. There is nothing wrong with playing other games instead of science, and there is nothing wrong in people with or without scientific degrees playing these other games. But honesty would seem to require that people be up front about which game they are playing. I have shown that, by this criterion, scientific creationists are either not honest about their own endeavors, or they aren't clear in their own minds about what it means to play the game of science.

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In any case, scientific creationism is not science and thus should not be so named. It is religious pseudoscience – religion masquerading as science. As a result, when scientific creationists, even those holding degrees in scientific subjects, promote scientific creationism, they are not acting in the role of scientists, even when they say they are, but in the role of religious pseudoscientists. This is an important distinction to be made, one that is often overlooked or not understood by the general public.

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Creationist and Fundamentalist Apologetics: Two Branches of the Same Tree

Robert M. Price

Scientific creationism as a movement is practically coterminous with Protestant fundamentalism, yet creationists, seemingly, would like us to believe that this correlation is accidental. That is, while a fundamentalist must needs be a creationist, the reverse is not necessarily true: anyone may be a creationist so long as he or she approaches the data with an open mind. While many opponents of creationism have regarded such claims as simple attempts to disguise the strictly religious character of creationism (i.e., no one would espouse it whose religious beliefs did not demand it), a few have pursued the question one important step further. Might creationist polemics in fact be an apologetical, even an evangelistic, strategy aimed at the religious conversion of unbelievers? If this is so, then indeed one need not be a fundamentalist to accept creationism, but, the polemicists hope, accepting creationism will be the first step to eventually accepting fundamentalism as well.

I suspect that there *is* such a hidden agenda implied in creationist polemics and that a clear analogy may be traced between creationist argumentation and admitted fundamentalist apologetics. The analogy can be shown to be so close as not to *be* an analogy (i.e., between two *separate* but similar things) at all; rather it becomes clear that creationism is simply one more branch of evangelistic apologetics sharing the same goal of preparing the ground for faith and conversion.

The Apologetical Task

Francis A. Schaeffer, surely one of the most prolific and influential writers on the contemporary fundamentalist scene, explains the nature and purpose of apologetics: "There are two purposes of Christian apologetics. The first is defense. The second is to communicate Christianity in a way that any given

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generation can understand. . . . It is unreasonable to expect people of the next generation in any age to continue [to believe] in the historic Christian position, unless they are helped to see where arguments . . . brought against Christianity . . . by their generation are fallacious." (*The God Who Is There*, p. 139) In other words, the apologist for the faith must seek to soothe the doubts plaguing the faithful and to remove the roadblocks in the path of unbelievers who might otherwise come to faith. The apologist tries to defend the faith by showing that it is reasonable; one need not kiss one's mind goodbye in order to convert.

All fundamentalist apologists would agree thus far; yet, though the difference is seldom recognized, we soon come to a crucial parting of the ways. Some apologists would press on and carry the battle into the enemy camp. Not satisfied with demonstrating the reasonableness of Christianity, they want to prove that it is the only rational, or at least the most compelling, intellectual option. This difference in intent might seem to be merely a difference in degree but is actually a difference in kind. The nature of argumentation in each case is (or should be) very different. It is evident, at least to outsiders, that the first variety of apologetics, the attempt simply to render faith plausible, essentially amounts to harmonization. This word is not imported into discussion but is actually employed by fundamentalists when they speak of "harmonizing apparent contradictions" between various biblical texts or between biblical texts and outside data. But it seems to me that almost all apologetics partakes of the nature of harmonization. The apologist strives to make faith plausible by reconciling aspects of modern knowledge which, even the apologist admits, at least *seem* to conflict with the faith. To achieve such harmonization of extra-biblical "troublesome data" (Thomas E. Kuhn), the apologist must resort to interpretations of that data (or of the faith) that admittedly seem a bit forced or strained, though still possible. That is, in and of themselves, the facts would not naturally suggest such a construal as the apologist wants to give them, but if one were sure on other grounds that fundamentalist beliefs were true, then the facts *could* be so construed. For example, one statement of fundamentalist hermeneutics makes this admission: "A passage of Holy Scripture is to be taken as true in its natural, literal sense unless the context of the passage itself indicates otherwise, or unless an article of faith established elsewhere in Scripture requires a broader understanding of the text" (quoted in Montgomery, *Faith Founded on Fact*, p. 225).

Suppose we suddenly had new and overwhelming reason to believe that the sun orbited the earth; then we would return to belief in the Ptolemaic "epicycles" to explain the retrograde motion of the planets, however implausible epicycles and geocentricity might have seemed in their own right. In the same way, the fundamentalist believes that his own experience of faith is

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overwhelming and independent evidence in the light of which otherwise implausible interpretations of extra-biblical data may be rendered newly plausible. Thus, as long as there is some (even barely) *possible* reading of the facts that would comport with faith's understanding of the world, then the reasonability of faith is vindicated. From faith's viewpoint, the new readings *are* the most plausible ones, precisely because conformity with faith is the new criterion for plausibility. Apologist Cornelius Van Til argues, in effect, that if Christ is the Logos, then the Christian reading of the facts is ipso facto the only logical one (*The Protestant Doctrine of Scripture*, pp. 10-12).

If this is how the apologist sees things, then how should he or she approach the unbeliever? The appeal, basically, is for the unbeliever to jump ship, come over to fundamentalism, and then the unbeliever will see things differently. It will not be denied or concealed that the fulcrum for this decision is an act of *faith*, but apologetical arguments will show that faith only goes *beyond* reason, not *against* it. It asks the unbeliever to go a step farther than reason will take him or her, but not to double back and veer off the path of reason. "The facts *can* be read our way, and once you accept our faith, you will agree this is the way to read them."

Now it might be doubted whether in every case such harmonizations hold up as fundamentalists claim they do. But for the sake of argument, let us suppose they do. We have said that some apologists are not content to leave it at this. They seek to convince the unbeliever not only that fundamentalist Christianity is quite possibly true so that faith ought not be dismissed out of hand, but also that the intellectually honest individual really has no other choice but to accept fundamentalism. For instance, Harold L. Fickett, Jr., remarks of Josh McDowell's compendium of apologetics, *Evidence That Demands a Verdict*, "I make bold to say that no intelligent person can read this with an open mind without coming to the conclusion that Jesus Christ is the unique Son of God and man's only sufficient Savior" ("Foreword" to Josh McDowell's *More Evidence That Demands a Verdict*, p. i).

The line of argumentation here has to be rather different. This type of apologist must try to show that the fundamentalist view entails readings of the facts that are not only consistent with faith, but which even apart from faith make the most natural, comprehensive sense. (Only in this way will the proposed reading of the data seem to point to faith and not vice versa, as in the first approach.) This is quite a tall order. And, notoriously, fundamentalists seldom fill that order. How can we account for this failure? What has gone wrong? It is facile to say that the facts simply do not support fundamentalist claims. And this, I agree, is often so. But how do we account for the false confidence that sends apologists on such a quixotic quest? Basically, they confuse the two apologetical strategies I have just differentiated, and having accomplished the first, they think themselves to have accomplished

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the second. The harmonized readings of the data seem so plausible to fundamentalists because of their faith that, without knowing it, apologists shift the criterion of plausibility and assume these readings will seem just as compelling to those without the faith. "It seems self-evident to *me*! Why can't *you* see it?"

The result of this subtle, but crucial, confusion is that much fundamentalist apologetics turns out to be, viewed without benefit of the eye of faith, a chain of weak links. Apologists frequently pursue a line of argument that shows at most that their reading of the facts *might* be the true one, and then seem to be satisfied that their position has been proven.

In the next pages I will briefly review a few standard apologetics arguments, drawing attention to the pattern of argumentation I have described. Finally I will show how the pattern and motive of evangelistic apologetics underlies creationist polemics as well.

The reliability of the Gospels

In the ongoing fundamentalist effort to vindicate the reliability of the four gospels as historical reports of Jesus, we can see both the inner- and outer-directed apologetical purposes described by Schaeffer. Apologists wish to reassure believers that they can rely on the cherished inherited picture of their Lord. Richard Bauckham in his booklet *Knowing God Incarnate* (which, by the way, is not a work of apologetics in the sense being discussed here) puts his finger on the heart of the issue. "The more [the Christian] is aware that critical scholars regard many features of the Gospels as later interpretations of the history of Jesus, which must be set aside in the quest of the historical Jesus, the more he may wonder whether the Gospels are not impediments as well as aids to his knowledge of Jesus. . . ." (p. 4). In other words, a fundamentalist pietist who rejoices in a "personal relationship with Jesus" will understandably be alarmed if told that the gospels, our only substantive evidence about Jesus, may be to a greater or lesser degree, historically inaccurate. So the apologist reassures such readers that the gospels are accurate.

The unbeliever, however, may be anything but alarmed at the suggestion of gospel inaccuracy. Indeed, the apologist imagines, he or she may rejoice at precisely that which alarms the pietist: if we cannot know about Jesus as he really was, we need consider him to have no greater claim upon us than the mythical Mithras or Dionysus. So to reassure the faithful and to challenge the faithless, the apologist seeks to rebut the conclusions of New Testament critics like David Friedrich Strauss and Rudolf Bultmann where these seem to threaten fundamentalist beliefs.

Probably the most important argument for the accuracy of the gospels is

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that not enough time elapsed between the life of Jesus and the writing of the gospels for any substantial growth of legends or secondary sayings to have grown up. Josh McDowell claims that "the period of oral tradition (as defined by the critics) is not long enough to have allowed the alterations in the tradition that the radical critics have alleged" (*More Evidence That Demands a Verdict*, p. 205). John Warwick Montgomery echoes, "With the small time interval between Jesus' life and the Gospel records, the Church did not create a 'Christ of Faith.' . . ." (*History & Christianity*, p. 37). The period in view is between forty and sixty years (i.e., from Jesus' death to the probable dates of Mark and John, the earliest and latest of the gospels. Apologists point out that this is not so long a time that memory would necessarily fade and distort the details of what must surely have been memorable events. Besides, they argue, we need only compare the case of the Buddhist scriptures where *centuries* elapsed between the Buddha's death and the first records of his words or deeds. These are points well taken.

Yet on the other hand, it is clear from studies of the careers of other prophets and religious founders closer to our own time (and about whom consequently more evidence survives) that an exuberant growth of legend and fantasy *could* spring up in much less time than the forty to sixty years available in the case of the gospels. In the case of the Congolese prophet Simon Kimbangu, we find the master already in his own lifetime unable to stem his followers' enthusiastic preaching that he was the "God of the Blacks." In the case of Sabbatai Sevi, the seventeenth century Messianic pretender, contemporary miracle stories abounded despite the disclaimers of his chief apostle Nathan of Gaza. Examples could be multiplied. So on the one hand, it is quite *possible* for the gospels to have maintained a historically pure tradition in the oral period, but on the other hand, legends and teachings spuriously attributed to Jesus *could* have crept in during this interval.

Apologists often appeal to the central role of eyewitnesses in making sure the early traditions of Jesus remained free of accretions. F. F. Bruce contends that "it can have been by no means easy as some writers seem to think to invent words and deeds of Jesus in those early years, when so many of his disciples were about, who could remember what had and had not happened" (*The New Testament Documents: Are They Reliable?*, p. 45). Yet we have already seen that Simon Kimbangu and Nathan of Gaza did try to call a halt to such fabrications in their own analogous situations but were unsuccessful. If the disciples of Jesus had been so concerned, can we be sure they would have met with any more success?

Some apologists point to the work of Harald Riesenfeld which tries to parallel the (hypothetical) practice of Jesus and his disciples with that of the later rabbis. The disciples of the latter carefully memorized their masters' teachings and transmitted them word for word "like a plastered cistern that

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loses not a drop." Jesus, too, was called a rabbi, so may not the Twelve have similarly memorized his sayings? Perhaps they did, but this does not mean the *gospels* must accurately preserve Jesus' teaching, since the point at issue is whether the gospels contain only genuine eyewitness material. Insofar as they do, that material may well be accurate, but it is a matter of great debate as to how much of the gospel traditions stem directly from Jesus and his disciples. Again, apologists have made their claim *plausible*, but they seem to think that they have *proved* it. Does this evidence "demand a verdict"?

The Inerrancy of the Bible

At first sight a discussion of biblical inerrancy might seem redundant, but it is not. The defense of gospel accuracy intends to safeguard knowledge of Jesus Christ, the central object of faith, but apologetics for inerrancy have to do with theological epistemology. Granted one trusts Christ for salvation, how is one to form his or her opinions on doctrinal and ethical issues? Here of course is where "biblicism" comes in: "The Bible said it—I believe it—That settles it!" This absolute trust in the Bible extends even through otherwise insignificant details, since if one cannot trust the Bible's assertions at one point, how can one be sure of it at *any* point? This is important, since the believer is concerned about matters (e.g., life after death, the nature of salvation) on which there can be no other, independent ground of certainty.

As is well known, fundamentalists must harmonize here as nowhere else, and some of the resultant contrivances are particularly incredible. For instance, all four gospels report that Peter denied knowing Jesus three times, but beyond this the accounts fail to agree. Mark has Jesus predict that Peter will deny him thrice before the cock crows twice. Other gospels mention only one crowing, implying that all three denials must proceed uninterrupted and be terminated by a cock-crow. Then again, the four accounts do not agree precisely to whom Peter denied Jesus. For generations fundamentalists have puzzled over this problem and ever so often one of them will harmonize all the evidence so as to conclude that Peter denied Jesus six or eight times, just to get all the details in! While we might imagine the cowardly Peter thus denying a blue streak, no one of the gospels hints at such an occurrence. Indeed such a desperate expedient backfires in unwittingly implying that the gospels are badly mistaken on this point since none of them report more than three denials! This whole business is implausible (to say the least), but it *is* possible, just barely, on the face of it. But fundamentalists who adopt this approach (e.g., Harold Lindsell in *The Battle for the Bible*) find it quite plausible, because the criterion of plausibility is conformity with the prior belief in biblical inerrancy! Yet how can Lindsell expect anyone else to be persuaded?

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Less ludicrous, but illustrative of the same point, is the apologists' treatment of the census of Quirinius in the Gospel of Luke. Luke records this decree as the occasion for Mary and Joseph being in Bethlehem for the birth of Jesus. The trouble is that extra-biblical evidence indicates that Quirinius was governor of Syria only about ten years later! Apologists suggest that perhaps earlier in his career Quirinius had a previous tenure, officially or unofficially, as governor. Even if there were any real evidence for this, it still would not remove all the difficulties, but let us grant that this hypothetical earlier tenure for Quirinius might make Luke's version *possibly* accurate. It would do so by means of a less than probable reading of the facts—less probable, that is, from the historian's standpoint. From the standpoint of the believer in inerrancy, there is no embarrassment at all, since the mere fact that this historical reconstruction comports with inerrancy *makes* it plausible.

Now while any one or two of these harmonizations *might* turn out to be "strange-but-true" if we had all the facts, it is important to realize that the belief in inerrancy depends upon a whole zoo-full of such monsters, a fact the reader may confirm by examining any of several fundamentalist books on "Bible difficulties." Why is the apologist not daunted by what would seem so vast a flock of albatross? Because they are all *possible* readings of the facts which become compelling by their conformity to faith. And to the fundamentalist this palace of cards seems so awesome in its ingenious grandeur that he or she cannot imagine why the outsider is not impressed. Then the accusations of intellectual dishonesty begin to fly.

Scientific Creationism

At last we turn to creationism. I believe it will require no extensive demonstration to show how similar in logic and procedure many creationist arguments are to those outlined above. In creationist literature it is common to find otherwise tenuous theories being preferred simply because they conform most closely to "the creation model." Creationists champion Moon and Spencer's theory that the red shift has been seriously miscalculated, and so light need not have traveled through space longer than creationism says stars have existed. But if this proves unworkable, then we may posit that God created the starlight already in transit. Any reading of the facts will do, as long as it seems to support creationism. (There is no point in belaboring this, since most readers are by now familiar with creationist arguments.)

What is worth pointing out, however, is that we need not merely try to infer that the creationists are moved to their harmonizing tactics by the same apologetic zeal that impels proponents of gospel accuracy and biblical inerrancy. Creationists themselves are candid about the matter.

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> The acceptance of the theory of evolution has promoted apostasy because it has caused a radical change in the view of Scripture. If the theory of evolution is accepted, then it must be conceded that the Bible contains myths and legends. . . . This logical chain of events in the interpretation of Scripture culminates in the abandonment of the blood atonement of Christ. There remains no Christian gospel (Duane T. Gish, *Evidence Against Evolution*, pp. 19, 20).

> It is this author's belief that a sound Biblical exegesis requires the acceptance of the catastrophist-recent creation interpretation of earth history. If this interpretation is accepted, the evolution model of course, becomes inconceivable (Gish, *Evolution: The Fossils Say No!*, p. 64).

John C. Whitcomb and Henry M. Morris announce at the outset that the purpose of their work *The Genesis Flood*

> is to examine the anthropological, geological, hydrological and other scientific implications of the Biblical record of the Flood, seeking if possible to orient the data of these sciences within this Biblical framework. If this means substantial modification of the principles of uniformity and evolution which currently control the interpretation of these data, then so be it" (*The Genesis Flood*, p. xx).

We could ask for no more explicit statements of the apologetical intent to harmonize the data with the criterion of biblicist faith. Our preceding discussion makes it clear just why Gish, Morris, and other creationists remain so convinced in the face of repeated refutations by scientific critics. They are so impressed with their own harmonizations that they do not see that harmonization can never convince one who does not already accept the independent belief with which the facts have been harmonized.

It might be suggested that creationist apologists are not unaware of their real obligation to demonstrate that their model makes better sense of the data in their own right scientifically (however poor a job they may do of it). For instance, is not this the point when they criticize the theory of evolution by invoking against it the second law of thermodynamics and the absence of transitional forms from the fossil record? I would contend that we are still dealing with harmonizations since the creationists consistently choose interpretations of the second law and of the relevant fossils that are considerably strained in the direction of creationism. The second law is always made to apply to the increasing complexification of evolving life-forms, despite the demonstrated inapplicability of the law to an open system such as earth's biosphere. Similarly Gish refuses to recognize the clearly transitional nature of the archaeopteryx, ruling instead that anything with feathers and wings has got to be a bird (*Evolution: The Fossils Say No!*, p. 90).

If creationist arguments can be seen to be of a piece with fundamentalist apologetics in regard to method, the same is true when it comes to motive. Creationism is what Frances A. Schaeffer calls "pre-evangelism," apologetics

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as a laying of groundwork for conversion. For creationists believe that evolutionists are damned and going to hell, indeed not simply for their espousal of Darwin's doctrine, but because of what else this denotes.

> The reason most scientists accept evolution has nothing to do, primarily, with the evidence. The reason that most scientists accept the theory of evolution is that most scientists are unbelievers, and unbelieving, materialistic men are forced to accept a materialistic, naturalistic explanation for the origin of all living things (Gish, *Evolution: The Fossils Say No!*, p. 24).

> We believe that most of the difficulties associated with the Biblical record of the Flood are basically religious, rather than scientific. The concept of such a universal judgment on man's sin and rebellion, warning as it does of another greater judgment yet to come, is profoundly offensive to the intellectual and moral pride of modern man and so he would circumvent it if at all possible (Whitcomb and Morris *The Genesis Flood*, p. xxii).

> The theory of evolution is, if rightly understood, nothing but "bad news," a delusion of Satan, offering . . . only meaningless existence and imminent death for the individual. . . . But the message of the Bible is "good news," the *gospel* of Jesus Christ, offering forgiveness and eternal life, as well as meaning and purpose for the present life, to every person who responds in faith to Him as Creator and Saviour and Lord (Morris, *Evolution and the Modern Christian*, p. 68).

It is clear, finally, that Morris sees the task of arguing for creationism as literally evangelistic. Noting with regret that not all students are blessed with "Christian schools" in which they may and should be "taught all their school subjects in the true framework of Biblical creationism," Morris declares that "We need urgently to reach the host of others [i.e., students in public schools] with literature which will in some way open their minds and hearts to the true Biblical cosmology" (*Evolution and the Modern Christian*, pp. 6-7). In his pamphlet *Introducing Scientific Creationism into the Public Schools*, Morris advises fundamentalist students on the most effective methods "to counteract the evolutionary teaching in their own classes and schools" and describes it in terms of "whatever witness they may be able to give" (p. 8).

So the evangelistic motive of most creationists ought to be clear. And this fact in turn clarifies something else. It explains why those who pose as men of science tend in public debate to rely on rhetorical techniques and emotional appeals that would seem more at home in an evangelistic meeting. Of course, Gish and company view public forums on evolution and creation precisely *as* evangelistic meetings! They are contending for souls and will use any appropriate strategy: "We destroy arguments and every proud obstacle to the knowledge of God, and take every thought captive to obey Christ" (II Cor. 10:5).

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Polemical Arguments

Let us examine briefly three types of polemical arguments used commonly by fundamentalist evangelists and by scientific creationists. Each, by the way, entails the commission of a blatant fallacy of logic.

First, evangelists commonly cite authorities, sometimes out of context, in order to settle some question quickly and tidily without a complicated appeal to the facts of the matter. For instance, to convince hearers (or readers) that the Antichrist and the Tribulation are on their way and that the audience had better repent now, Hal Lindsey (*The Late Great Planet Earth*), John Wesley White (*Re-Entry*), or Tim LaHaye (*The Beginning of the End*) will quote all sorts of doom-saying futurologists to the effect that the world cannot go on along its present course much longer. Of course none of the authorities quoted were discussing the biblical Armageddon, but so much the better. They are deemed relevant authorities precisely because their statements can be brought in to support the evangelists' message from without. "Surely Paul Ehrlich and Barry Commoner have no religious axe to grind, so if you are suspicious about Lindsey, you certainly must believe *them*!"

In exactly the same way, creationist debaters do not tire of appealing, e.g., to Karl Popper and his criterion of falsifiability (i.e., if we cannot even suggest a condition whereby a theory might be disproved, then the "theory" is so indefinite as to be meaningless). They ignore the fact that Popper's dictum is itself the subject of some debate, and the appeal is often simply to Popper as a recognized authority. And again, it matters not whether Popper himself would apply his criterion to the theory of evolution; he may be cited as a pro-creation witness anyway. And the creationist has likely not thought beyond the bare appeal to the "big name." It is in fact quite easy to show that evolutionary theory passes Popper's test with flying colors, but the creationist did not pursue it thus far. The proof-texting of the authoritative name would settle the argument, just as a biblical proof-text will settle a question among fundamentalists.

Second, an evangelist will often seek to paint a grim picture of the secular world of sin from which he seeks to win his audience. To do this he commits the circumstantial *ad hominem* fallacy. He cites the sinners' own spokespeople against them in piecemeal fashion and out of context to create the false impression of a consensus of despair. "If all your thinkers have lost faith in their own position, why should *you* stick with it? Jump ship and come over to our side." Os Guiness, in his *The Dust of Death*, surveys the options and false hopes facing Western culture and comes up with this dreary report: "The West today, its self-confidence sagging, its vitality ebbing, its order eroded, knows only introspection, lethargy. . . . Prone from exhaustion, a prey to its own fears, it is in danger of being overwhelmed by the anxiety,

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apathy, and anger of a humanity strangled within it" (p. 317). Guiness is able to "document" this bleak diagnosis only by selectively citing pessimists throughout. He picks quotes from secularists dissatisfied with each option he is considering at the moment, giving the impression that *all* secularists have abandoned hope on all fronts. Then he offers his faith as the glowing alternative, as if none of his quoted sources had ever contemplated (or rejected) traditional religion before!

Creationists pursue the identical strategy when they quote various scientists of different disciplines piecemeal as they each critique some evidence in their own specialty. It is as if all these scientists were caught in a rare moment of honesty admitting that evolutionary theory really is full of holes. It does not matter that others in the same specialty would counter the critiques, that others would suggest other reasons for the problems noted, consistent with (or even demanded by) evolutionary theory. Nor does it even matter that the scientists quoted do not themselves see their criticisms as falsifying evolution as the creationists do. Again what we have is a kind of selective and out-of-context proof-texting that naturally appeals to fundamentalists because of their accustomed use of Scripture. And the debators hope the weight of collected criticism or the evidence from each scientific discipline will appeal to the audience as well.

Third, evangelists are extremely fond of the fallacy of bifurcation, the practice of setting forth a small set of alternatives (usually, though not always, two) as mutually exclusive and exhaustive. "You must choose between these; there are no other choices, nor any shades of gray." Of course in life we do sometimes face such choices; the fallacy lies in oversimplifying what is really not so stark a choice. Evangelists insist that Jesus must have been either "Liar, Lunatic, or Lord": he could not have been simply a prophet or moral teacher. Actually the situation is much more complicated than this (see my pamphlet "'Liar, Lunatic, or Lord'—A False Trilemma"). Are the gospels accurate? The only choices, we are asked to believe, are "hoax or history." As we have already seen, scholarship shows that it is not so cut-and-dried.

This approach also accounts for the persistent fundamentalist Christian misrepresentation of all non-Christian religions as simply various schemes of "salvation by works." The potential convert is being told that the choice is clear: here is Christianity, the religion of grace alone; there is the whole sorry lot of Judaism, Buddhism, Islam, and Hinduism, all of which despite their secondary differences boil down to works-salvation. The purposes of evangelistic rhetoric with its demand for "decision now" would not be well served if the preacher/pamphleteer were to urge the reader to undertake a careful study of gospel historicity or of comparative religion. The choice must be black and white, the decision must be made simply and immediately.

It is obvious that creationist debaters are no less enamored by the bifur-

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cation fallacy. Indeed it is one of the chief weapons in their arsenal. We have already seen how Morris opposes the death-message of evolution to the life-message of the gospel. But beyond this, it can be said that the entire creationist polemic is structured according to the fallacy of bifurcation. Most of their efforts to "defend the creation model" are in fact attempts to poke holes in the evolution model. How could they see the two attempts as equivalent unless they assumed that evolutionism and biblical creationism were the only two options? Only on this (erroneous) presupposition could it seem that to disprove the one (if it could be done) would be to prove the other.

Conclusion

I have attempted to show, both by analogy with evangelistic apologetics and by explicit statements from creationists themselves, that the polemical enterprise of creationism is actually one more strategy of "pre-evangelism." It is intended to persuade unsaved evolutionists to discard faith in evolution and to embrace faith in the Bible, first in the matter of cosmology, then in the matter of faith in Christ to save one's soul. Accepting creationism and rejecting evolution is seen to be a necessary step preliminary to salvation, since fundamentalists do not imagine that one can believe in Jesus Christ as savior without also adhering to biblicism. Whatever the merits or demerits of such a belief theologically, it can hardly be denied that the creationist enterprise must be seen as primarily religious, not scientific, in nature and purpose.

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Footprints in the Dust: The Lunar Surface and Creationism

Steven N. Shore

Perhaps the strongest, most appealing claim that the creationists have put forth against evolutionary timescales is the rate of infall in interplanetary dust into the terrestrial atmosphere. Frank Awbrey, in this journal, has detailed the arguments put forward in the creationist tracts on the age of the earth. There are, however, a few points which should be added, especially concerning the nature of the lunar surface, since it is also a useful lesson in the workings of scientific argument and the reasons for space exploration in the first place.

Measurements of the rate of infall of meteoritic material were first accomplished using the U-2 as a collection device, and by measuring the amount of contamination by interplanetary material in dust falling atop Mauna Loa.[1] The rate which he got, now known to be about an order of magnitude too high, was the first serious attempt to derive the number density of interplanetary material by something other than the brightness of the Zodiacal light (the bright band of solar illuminated interplanetary dust which is a permanent resident feature of the solar system). The current rate, which is quoted by Hartmann[2] in his recent review text on the solar system, is $10^{\frac{8+1}{}}$ kilograms per year for the Earth and about 4×10^6 kilograms per year for the Moon, the latter being a directly measurable quantity.

First, notice that the figure is considerably higher (and more uncertain) for the Earth. The reason is Newtonian gravitation—the accretion radius of the Earth is correspondingly larger due to its greater mass. The fact that the scaling works quite well is an indication that the measurement can be trusted. The second is that the rate of overall infall is in very good agreement with the cratering characteristics of the lunar material. I should explain this a bit more, since it is a powerful argument and one which the creationists have never bothered to worry about.

The surfaces of airless bodies are constantly pummled by infalling debris. which, because there is no atmosphere to slow the infalling particles to terminal velocity, arrives at the surface at essentially the escape velocity. For the

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Earth, this would mean that the infall would arrive at about 10 kilometers per second. Even a piece of fine dust at this ballistic velocity would pit any rock, with a known "crater" to particle radius ratio. From counting the rate of production of craters on every piece of lunar material as a function of the size of the crater, it has been concluded that the surface of the Moon is literally saturated by the infall—the primary source of erosion on the surface is due to this debris infall. Now in order for this to occur, there must be a definite spectrum of infalling particles so that by averaging over the observed crater distribution, it is possible to calculate the total rate of infall of the dust and larger bodies and to compare this with the actual observed rate. The two agree very well.

In the case of Mercury, although we have not been able yet to set even a mechanical foot on the surface, we can still count the larger craters and observe that they derive from the same distribution as is responsible for the lunar surface morphology. If the cratering has been going on for only 10,000 years, as the more avid literalist creationists would have one believe, the rate of cratering must have been astonishingly high at an instant, or else we are measuring far to little infall at present, because the surface we see is in effect in equilibrium. This is absolutely impossible with the information that the creationists use. There is simply not enough time in their model to provide for the surface as we see it. In fact, it even leaves open a stronger violation of observation. If the Earth and everything else were as young as they claim, there should be many more large craters on the Earth's surface, since erosion would not have had sufficient opportunity to remove them on this atmosphere-dominated planet. Again, it is impossible to imagine under what conditions the laws of physics which we see in operation now could have been superceded in the so-recent past.

Well, never mind, they will say. The point is that the best calculations of the lunar surface indicated that there should be an enormous dust layer on the Moon into which the astronauts would sink—the very fact that the best evolutionary calculations gave an unambiguous answer that there should be several meters of dust on the surface which was subsequently not found should itself be an indication that the theory is clearly wrong.

Let me make one minor aside here, since as in all of the creationist arguments this one on the nature of the infall clearly points to a hidden agenda: "Since the scientific theory leads to some disagreement, and there can be no dissention in matters of truth, the scientific arpproach must be wrong and consequently misleading and useless. On the other hand, *Genesis* is the word of God which, being infallible, is an absolute meterstick for measuring truth." One should never lose sight of this attack on the scientific method in all of the creationist writings. It may not be stated as such, but it always lurks beneath the surface.

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Now back to our tale. In 1965, a conference was held on the nature of the lunar surface.[3] The basic conclusion of this conference was that both from the optical properties of the scattering of sunlight observed from the Earth, and from the early Ranger photographs, there was no evidence for an extensive dust layer. In fact, some three years before we set foot on the moon, there was already hard evidence that the dust layer must be quite thin. The creationists would of course point to the fact that this was stated only after we had sent probes to the Moon. But wait, there is another source for the same statement. In a conference held in late 1963, on the Lunar Surface Layer, McCracken and Dubin[4] state that

> "The lunar surface layer thus formed would, therefore, consist of a mixture of lunar material and interplanetary material (primarily of cometary origin) from 10 cm to 1 m thick. The low value for the accretion rate for the small particles is not adequate to produce large scale dust erosion or to form deep layers of dust on the moon, for the flux has probably remained fairly constant during the past several billion years." (p. 204)

They also state that the rate of infall of material with masses smaller than 10 kg has been about 1 gram per square centimeter during the past 4.5 billion years, a result which is completely in agreement with the modern measurement. The *most* one could expect was a layer some 1 meter deep, not the norm of the predictions. All of the participants at the earlier conference agreed that the rate of infall should in fact be low. They also argued that the lunar surface should be eroded on a small scale, and that the jagged appearance hypothesised by the earlier ground-based observers should be modified to allow for the results of dust and solar wind impact. To be sure there were predictions of a deeper layer, notably by Gold using the erosion from the solar wind (assuming properties of the lunar material which have since been shown to be too fragile) and by Salisbury and Smalley[5] in the 1963 conference, which suggested that a debris (rubble) layer could be an average of 60 cm thick. The essential point of these measurements from the ground was that we would know once the space probes reached the Moon.

The thing to keep in mind is that the predictions of the surface properties of the Moon were based on very questionable laboratory simulations and on quite preliminary data from terrestrial measurements. Using these numbers, the values which resulted from the theory of surface morphological changes could vary widely. The reasons for sending probes up was to determine what the rate of infall is, to achieve at least some hard numbers which everyone could agree on and use for subsequent predictions in their models.

It should also be mentioned that the fact that the surface cannot be very dusty was also known from the infrared observations[6] of the moon during eclipse. The rate of cooling of a surface depends on the conductivity, or poricity, and therefore on whether it is dusty or not. The fact that craters

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on the surface stay hotter longer into the eclipse (totally improperly attributed by the creationists to the actual heat flow from the interior of the body) is a direct evidence that the floors of the craters are debris-strewn. That the lunar surface as a whole cools very quickly was already known as well years before we set foot on the surface, and was consistent with the layer of dust which was finally shown to be present.

In short, this addendum and expansion on Awbrey's article is simply meant to place the question of influx in its proper perspective. The number for the rate of meteoritic infall is important, but is at best a backwater in the far greater question of the origin and development of the solar system. The creationists have contributed nothing to this argument, and in fact have even argued among themselves about the value, and so we should simply leave this to the historians as an interesting sidelight in the race for the Moon, and go on with the business of planetary exploration. Our footprints have been left in the dust that was expected, and the question is settled.

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EDITOR'S NOTE: What follows is a continuation of a debate from last issue on the design argument for special creation. In the last issue, Norman Geisler presented his basic case. Frederick Edwords responded, and William Thwaites expanded upon the whole question with an article that covered issues such as the probability of evolution and the evidence for natural selection. What follows below is Norman Geisler's rebuttal to both Edwords and Thwaites, followed by Edwords' counter-rebuttal. The "Letters to the Editor" section of this issue contains additional comment on this debate.

Uniformity and Creation: A Response to Edwords and Thwaites

Norman L. Geisler

Suppose that upon meeting some evolutionist friends at Mount Rushmore we inform them of our conclusion that uniform experience points to an intelligent cause of the information conveyed on the mountain side. And suppose in response that they point out that not all who posit an intelligent cause for this phenomenon agree on how long it took to produce these faces. Will this uncertainty about the time involved in their production minimize our conviction that they had an intelligent cause?

Or suppose further that one evolutionist suggests that even some round stones, such as the one found in the stream, may have been deliberately smoothed by an intelligent being. Will this diminish in the least the evidence in favor of an intelligent creator of the faces on Mount Rushmore?

Then suppose that our friends offer the unusual argument that the information reflected in these faces does not need an intelligent cause any more than a round stone needs a round cause. Would we not upon further scrutiny recognize this to be the logical fallacy of emphasizing the accidental?

In addition, would we not be puzzled if our evolutionist friends implied that since stratified stones or crystals have redundant patterns in them, then

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we can expect that when a river deposits enough of them it will eventually produce its own Mount Rushmore, faces and all?

Further, suppose that one of our evolutionist friends suggests that because thousands of replicas of Mount Rushmore have been mechanically reproduced as souvenirs that this redundancy somehow eliminates the need for an intelligent cause of the original faces on the mountain. Would this in any way affect our conviction about the need for an intelligent creator of these faces?

Suppose further that it is argued that nature has many formations in rocks which show vague resemblance to human or animal forms. Would the existence of these indistinct forms with probable natural causes take away our firm conviction that the distinct faces on Mount Rushmore had an intelligent cause?

And what would we think if one of our friends objected to an intelligent creator of Mount Rushmore saying, "I have never seen it sculpted, nor a sculptor of it"? Would he also reject an architect of the Great Pyramid because he had never seen such a pyramid built, nor such a pyramid builder? Or rather should he not be content with the principle of uniformity which calls only for a *similar* cause for *similar* effects to those observed in the present.

Further, knowing that *sculptors* were not sculpted by sculptors but that only *sculptures* need a sculptor, would we not be amused if our friend rejected a sculptor of Mount Rushmore on the fascinating, but irrelevant, premise that "every sculptor needs a sculptor." Surely he would not also insist that every painter was painted because every painting has a painter.

And what if one of our evolutionist friends admits that uniform experience confirms that watches have watchmakers. But he insists, nevertheless, that similar experience does not indicate that information, such as that on Mount Rushmore or in a living cell, had an information giver. Would a natural observer view this as consistent reasoning?

Further, noting that there is a "mathematically identical"[1] relationship between information conveyed by human intelligence and information in the DNA of a living cell, are we likely to be impressed by the evolutionist's claim that this is "a weak analogy"?

And no doubt we would even be perplexed if our evolutionist friends suggested that natural selection could account for the origin of the first living cell. For did not even the great evolutionist, Dobzhansky, declare that "prebiological natural selection is a contradiction in terms."[2] Surely everyone is aware that natural selection could work only after there are living things to select among.

Also, what if our friends declare that natural selection has "creative" powers which replace watchmakers and which operate the way an intelligent

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being forms words from Scrabble letters? Would we not wonder how a non-intelligent blind force like natural selection possessed the characteristics of an intelligent creator? And would not our suspicion be further confirmed when we hear other evolutionists declare that evolution has "arranged," "designed,"[3] or "composed"[4] things helpful to the continuance of human life?

And what if the evolutionists were to suggest that the intelligence which caused first life was *human* intelligence. Would we not be dumbfounded, knowing that he believes human beings did not emerge until millions of years later?

Further, is it not doubtful whether any person would give up his belief that the 20 million volumes of genetic information found in the human brain had an intelligent creator simply because we did not know just *how intelligent* such a creator of the brain is? How would ignorance about the degree of intelligence it had negate the knowledge that the evidence pointed to a *very intelligent* creator of life?

And what surprise would greet us were our evolutionist friend to proclaim that a process involving random mistakes on *Mary Had a Little Lamb* over long periods would be more likely to produce the likes of *Hamlet*, providing that this was not its ultimate goal. How would having no goal to reach a higher level of complexity in information be of assistance in achieving it? Does not repeated experience indicate that information becomes more garbled, not more complex, by introducing random mistakes undirected by any intelligence?

And in view of uniform experience in favor of an intelligent cause of information, we would surely be surprised to discover that one of our friends had declared that "evolution is inevitable." And to hear others insist that "evolution is a fact, not a theory"[5] should be shocking to all who, like our friends, claim that science is never "air-tight" but always tentative in nature.

But what then would we think if our friends should subsequently inform us that an appeal to a supernatural intelligence for the information in first life is "an impossibility"? Would we not surely wonder what had become of their profession that science is tentative in view of such an air-tight claim?

Especially would their claim that there is no such intelligent cause of life be surprising in view of the admission by our evolutionist friends that there are two known causes for information, one of which is intelligence. For if intelligence is a known cause of information, could not a creationist rightly inquire why it is unscientific to posit an intelligent cause for the tremendous volumes of information found in living things?

And what if our evolutionist friends declare that a scientist should never appeal to an intelligent creator of information as opposed to a purely natural law? Would we not wonder how productive their study of geology would be

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if they had to examine Mount Rushmore until they found some non-intelligent natural law of erosion to explain the faces formed there.[6]

Finally, in view of the fact that the father of modern evolution, Charles Darwin, called natural selection "my deity,"[7] might not some creationists be concerned about the religious implications of such a claim? This may be of special concern when they realized that one of our evolutionist friends said that all school children should be taught how Darwin, in view of evolution, gave up his former belief in a creator. And if in addition they discovered that this same evolutionist friend believed that the evolutionary view is the *only* one that should be taught in public schools, they may even be inclined to agree with the ACLU attorney, Clarence Darrow, who said at the Scopes trial, it is "bigotry for public schools to teach only one theory of origins."[8]

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1. See H. P. Yockey, "Self Organization Origin of Life Scenarios and Information Theory" in *The Journal of Theoretical Biology* (1981) 91:16.
2. Theodosius Dobzhansky, in *The Origins of Prebiological Systems and Their Molecular Matrices*. Edited by S. W. Fox, New York: Academic Press, 1965, p. 310.
3. See Carl Sagan, *Cosmos*, New York: Random House, 1980, p. xiii, and Sagan, *Broca's Brain*, New York: Random House, 1979, p. 11.
4. Theodosius Dobzhansky, as cited by T. Bethell, *Harper's Magazine*, Feb., 1976, p. 70.
5. Carl Sagan, *Cosmos*, p. 27 (emphasis added).
6. This methodological naturalism is contrary both to the origin and nature of science. See N. L. Geisler, *Is Man the Measure: An Evaluation of Contemporary Humanism*, Grand Rapids: Baker Book House, 1983, ch. 11, and *Miracles and Modern Thought*, Grand Rapids: Baker Book House, 1982, ch. 4.
7. Letter to Lyell (Oct. 20, 1859), cited by James Moore, *The Post-Darwinian Controversies*, Cambridge University Press, 1979, p. 322.
8. R. O'Bannon, *Creation, Evolution and Public Education* 5, Dayton Symposium on Tennessee's Evolution Laws, May 18, 1974.

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Apples and Oranges: A Response to Geisler

Frederick Edwords

The first reaction William Thwaites and I had upon reading Geisler's response was that it was riddled with strawmen. For example, we never claimed and never would claim that disagreements over the time it took to carve Mt. Rushmore argues against its being carved, that river deposits could form Mt. Rushmore, that the existence of souvenirs of Mt. Rushmore argue against Mt. Rushmore being designed, that because we had never seen a pyramid built that the Great Pyramid did not have an architect, that though watches have watchmakers Mt. Rushmore did not have an "information giver," or that sculptors are themselves sculptures in need of a sculptor.

But, on asking ourselves what could lie behind Geisler's use of such strawmen, it became obvious what Geisler's point has to be. He must be arguing: "If it is absurd to say these things about the origin of Mt. Rushmore, then, by the principle of uniformity, it is absurd to say these things about the origin of DNA or human beings." By the same token, "If it is reasonable to say something about the origin of Mt. Rushmore, then that reasoning applies equally well to life forms." He therefore challenges us to demonstrate a non-intelligent origin for Mt. Rushmore in order to demonstrate a non-intelligent origin for life. Such an approach assumes we depend on his weak analogy for our own arguments, but, more importantly, it assumes that Mt. Rushmore and life forms are really that comparable.

Geisler's only comparison of Mt. Rushmore to life is to argue that both show "marks of contrivance" in the form of "information." And from this he concludes that both are therefore comparable in origin. He may as well conclude that both are therefore products of a sculptor's chisel!

Though Geisler defines the uniformity principle to mean, "similar causes produce similar effects," common experience often shows us that different causes can produce superficially similar results and similar causes can produce different results, as was argued before with the examples of dubious artifacts. This is why the principle of uniformity is not described by scientists in the

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way Geisler describes it. In science, uniformity means that natural relationships are assumed to apply throughout time and space. That is, once scientists develop confidence in a relationship, they assume it applies in the past and future and in other parts of the universe. Using the principle of uniformity properly, then, we can confidently declare that Mt. Rushmore was carved, even in the absence of the sculptor or any knowledge of him. We have seen other sculptors carve other things before. But the relationship between DNA and a supernatural creator or creators is unknown. In fact, we have no empirical evidence at all that allows us to state with scientific confidence that a supernatural creator is the cause of any result. In order for the principle of uniformity to demonstrate that a supernatural creator was behind the DNA code, we would have to have already established scientifically at least one relationship between such a creator and a result and then assume that other such results, when we found them, were produced by such a creator in different places and times.

To support his unique use of the uniformity principle, Geisler argues that the information conveyed by human intelligence is "mathematically identical" to the information content of a play by Shakespeare and of DNA. This is so, but such a fact actually destroys his case. For in order to equate the information content of carved faces to a Shakespearean play or DNA, this information must be encoded in some way. That is, a descriptive set of symbols is defined for various features along with a prescribed way of scanning these features. But carved faces are encoded in the same fashion that snow crystals are encoded. No mathematical distinction can be made between the information contained in the messages of life and of inanimate crystals (Yockey, 1981). Scientists can't simply look at coded information and see if it has significance. They must see what are the *results* of such information—whether the coded information is that of a living or a non-living entity. So Geisler's argument collapses. If information content is a similar result demanding a similar cause, then a snow crystal must have a cause similar to that of Mt. Rushmore. But we know from experience that the immediate causes for each are not similar.

In his original article, Geisler attempted to make a distinction between snow crystal information and DNA information by arguing that the former is "redundant." But how is "redundancy" defined scientifically? It could equally well be argued that repeating patterns in a DNA molecule are "redundant." "Redundancy" is not a scientific distinction, and therefore Geisler's argument requires that he posit special creation of each snowflake that falls.

Even if we ignore the snowflake problem, we are still dealing with only a single similarity. Isn't this superficial? How do other features compare? Let's ask some relevant questions.

Does Mt. Rushmore gather nourishment from the environment? No, but

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an amoeba does. Does Mt. Rushmore reproduce? No, but an amoeba does. Do mutations appear in Mt. Rushmore that can be passed on? No, but this happens with the amoeba. Can Mt. Rushmore die? No, but an amoeba can.

We could go on, but it should be apparent that Mt. Rushmore and a life form are not sufficiently comparable for us to assume comparable origin. This means that Geisler lacks a legitimate reason for applying his analogy in the first place. He is comparing apples and oranges.

In my first response to Geisler, I argued that there are two known sources for the "marks of contrivance" he presents, evolution and human intelligence. Life forms are the result of evolution and Mt. Rushmore the result of human intelligence. But I neglected to explain that one reason why the sources are so different is that life forms are "apples" while artifacts are "oranges." Geisler mixes the two, thinking them both "oranges," and ends up assuming similar or uniform sources for both. That is the flaw in his reasoning from which all others follow.

To carry this point further, we could apply Geisler's own criterion of "similar cause, similar effect" to argue "dissimilar effect, dissimilar cause." That is, since Mt. Rushmore is an individual artifact that just *sits* there, somebody had to come up and *carve* it. On the other hand, since an amoeba *moves*, *grows*, *reproduces*, *proliferates*, *mutates*, *passes mutations on*, and is generally part of a *process*, and since evolution is a process, then it is reasonable to argue that the amoeba *evolved*.

But, of course, the case for the evolutionary origin of life doesn't depend on the use of Geisler's misstatement of the principle of uniformity. Thwaites, in his response to Geisler, gave scientific support for the evolutionary origin of life. One of his points was that Eigen and his colleagues in 1981 showed replicating nucleic acids responding directly to natural selection. Geisler responds now by quoting Dobzhansky's statement that "prebiological natural selection is a contradiction in terms" and saying that "natural selection could work only after there are living things to select among." By this reckoning, nucleic acids must be alive. Since nucleic acids have been formed in the laboratory (Dolittle), Geisler's argument would lead us to conclude that the naturalistic origin of life has already been demonstrated, a conclusion he did not intend.

In any case, we see that there can be two very different causes for the "marks of contrivance" that Geisler sees both in life forms and in artifacts. "But," he seems to ask, "if there are two possible causes for the same thing, doesn't this fact lend support to the idea of teaching the 'two models,' creation and evolution, in public school science classes?" It would do so only if we could scientifically argue for Mt. Rushmore in these two ways and life in these same two ways, a foolish hope as Geisler has helped to show. Therefore, there is no "bigotry" involved in teaching only science in a science class.

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Divine design theories belong in a comparative religion class. That there are few such classes in public schools is due in some part to creationist objection to them, and that would account significantly for the "bigotry" of the public schools offering "only one theory of origins."

No doubt, Geisler would find this distinction unfair, since by insisting that creation is "religious," he would say the notion of intelligent design is arbitrarily declared unscientific in matters of biology while scientific in matters of archaeology. Aside from the aforementioned apples and oranges mistake here, there is another. Geisler does not posit a mere "superhuman intelligent being," such as an extraterrestrial, who is born, grows, ages, and dies—just like all other intelligent beings we know of, and hence just as his argument from uniform experience would require. He really means a *supernatural* creator, which is quite another thing.

Now, if Geisler contends that supernatural intelligence can be scientific, let him make a smooth argument leading logically from the natural to the supernatural. Geisler knows he cannot, which is why his arguments so studiously stop short of a supernatural creator. He can offer only signposts because a smooth and complete argument from natural to supernatural, corporeal to incorporeal, cannot be made without the use of a *non sequitor*. Not wishing to get caught making such a leap, he takes us only as far as the argument will carry us and hopes we will make the leap ourselves. All this renders his argument unscientific.

His attempt to begin from the naturalistic principle of uniformity and thereby reach a supernaturalistic conclusion is logically self-contradictory. If Geisler disagrees, it can only be because his belief system doesn't recognize the distinction between natural and supernatural but holds both to ultimately be supernatural. This is another apples and oranges problem.

Geisler's argument is a modest one. There is no pretense that a scientific theory of design is being offered. An argument merely from analogy can't be stretched that far. All Geisler hopes to establish is that direct design is at least a *plausible* cause of life. So far, however, it is saying to much to suggest that he has succeeded even in this.

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Letters to the Editor

The replies to Norman Geisler's "A Scientific Basis for Creation: The Principle of Uniformity" (Issue XIII) by Frederick Edwords and William Thwaites were long overdue. Geisler is ubiquitous as a defender of creationism; he often writes and speaks in public forums in defense of creationist legislation and he was a witness for the state at the Arkansas "Scopes II" trial. Yet he has been largely overlooked by scientists responding to "scientific" creationism.

As ably demonstrated by Edwords, Geisler's argument from the "principle of uniformity" is self-contradictory. Nevertheless, Geisler uses this argument as a two-edged sword to support creationism and to invalidate evolution. The uniformity principle argument permeates the theologian's advocacy of creationism and anti-evolutionism and it tells against him throughout.

For instance, on a program entitled "The Scientific Approach to Creation," from Geisler's radio series, *Quest for Truth*, the theologian offers the uniformity principle as he relates it to the origin of life and biogenesis. Geisler argues in this fashion: Louis Pasteur proved by experimentation that life does not arise from non-life. This fact is confirmed by common observation; we presently do not see life arising from non-life. In the present we see life always arising from life. If the present is the key to the past, Geisler argues, then "scientific reasoning leads us to conclude that in the past life did not arise except from a living Creator."

Geisler's argument is flawed throughout. It is true that Pasteur dealt a fatal blow to "spontaneous generation," but what does this have to do with creationism or evolution? Pasteur disproved the notion, derived from common observation, that complex organisms such as flies and maggots apparently arise from putrefying matter. This experimental demonstration by Pasteur really has nothing to do with the idea that life arose from non-life by a propitious series of small, incremental steps via chemical evolution. Pasteur's experiments cannot logically be used against an *evolutionary* scenario and in fact they give credence to evolution (if life arose naturally, it must have been by evolutionary mechanisms and not spontaneously). Since scientists are

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not arguing for the sudden arrival of complex organisms by spontaneous generation, Geisler is merely dropping a red-herring when he uses Pasteur to refute a natural origin of life.

Geisler's "scientific reasoning" concerning biogenesis is downright curious. *Life* always arises from *life*. The Creator is *living*; ergo, the Creator gave rise to life. This argument is a semantic trick that trades on the ambiguities of the words "life" (i.e., the organic) and "living" (i.e., in the context of the supernatural). This sematic game is exposed if we merely restate biogenesis as follows: (in the present) organisms always arise from organisms. Geisler is then forced to argue: organisms always arise from organisms; the Creator is living; therefore the Creator gave rise to organisms. His argument does not retain its logical coherence unless he acknowledges that the "living" Creator is an organism. If he does not, then his argument is a logical *non sequitur* (as well as empirically bankrupt) and is nothing more than a not-so-crafty play on words.

Geisler's use here of the uniformity principle is strangely naive and lacking in perception. He seems to believe that the principle of uniformity entails nothing more than common observation extrapolated to explain the past. Thus, if life does not arise from non-life, before our very eyes, it never has. However, the principle is broader than Geisler acknowledges. Its primary assumption is that physical and chemical laws observed today are invariant throughout time and do not allow true anamolies. Most scientists who have studied the issue of the origin of life believe that even though the early earth's composition was similar to the present, the combinations of the elements were sufficiently different. This negates Geisler's unstated yet crucial premise that early and contemporary conditions must be identical. We know from experimental evidence that certain chemical processes relevant to the origin of life are possible given certain conditions that are equally possible; processes and conditions that are not outside invariant natural law (and therefore do not violate the principle of uniformity).

It is Geisler, not the evolutionist, who is abrogating the principle of uniformity as he introduces supernatural creation that is by definition outside the boundaries of invariant law. The theologian pleads for the uniformity principle and then violates it, all in the same argument!

Jerry Wayne Borchardt

Last year I took a course in geophysics; during the class we read about particle bombardment effects on meteorites, on the lunar surface, and on lunar rocks. Being a former creationist, I wondered how one could explain the vast erosion that

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had taken place on the meteorites (as seen in the particle track densities—and this even after much surface has been burned off in atmospheric entry), on the lunar surface, and even on the rocks buried deep in the regolith in a time span of only several thousand years.

The only explanation (other than the "Adam's navel" argument) is that the erosion rate, the number of particles impacting over time, was higher in the past by a factor of about 0.75 million. That's an awful lot. As Frank Awbrey described it in Issue XIII, this would indeed be a "monumental cosmic sandblaster." But, anyway, it's a perfectly *natural* explanation. So, we could be scientific, set it up as a hypothesis, and attempt to test it.

But creationists do not do this, and this is why they are not scientific. Any idea, whether it can be tested or not, is acceptable as long as it supports the three central ideas of creationism: the recentness of the creation, the divine creation and thus non-evolutionary ancestry of humans, and the recent worldwide flood. (And, actually, it is the second idea listed here that creationists are really concerned about.) After all, a creationist (or any fundamentalist) is not looking for useful explanations of what we see in the world around us. The creationist is interested in the preservation of her or his faith in the infallibility of the Bible. Everything else is secondary. To say the Bible is incorrect in any way whatsoever is blasphemy and can put one in danger of not making it to heaven (and you know what that means!).

"What? You have found something that is inexplicable according to the Bible. No way. Somehow, some way, God has done it. Remember, God's ways are beyond mere human understanding. If we must resort to miracles (non-testable events) to reconcile what we see in nature with what the Bible says, then so be it. We cannot trust our senses, or even our minds, but we must put our faith in the Bible to be pleasing to God."

How droll! But this attitude is taken seriously by millions of people. Hopefully, we can continue to protect ourselves from such in the future. Journals such as yours are helpful. And thanks to Frank Awbrey for his instructive article.

Todd Greene

Thank you for your devotion to the integrity of science, and thank you especially for your devotion to pure undistorted Biblical teaching. I really appreciated the last two issues! As a committed Christian, I am deeply worried about the bad name that is being brought upon Jesus and His message by creationist activities. It is tremendously comforting to know that Christianity is not being identified with creationism everywhere yet. Though *Creation/Evolution* is a scientific periodical, I would strongly recom-

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mend that you pursue further the incompatibility of creationism with proper biblical exegesis in future issues. I have many creationist friends in my Bible study and church groups, and as a result, I have had a great deal of contact with creationist thinking in the last several years or so. It cannot be overemphasized that creationists are not creationist because the scientific evidence seems to them to lean toward it. They are creationist because they feel the Bible teaches it. As long as the scriptures seem to them to cry creationism, no amount of scientific evidence will do, however overwhelming it may be. Until the Biblical side of this controversy is laid to rest once and for all, there will be a creationist movement battling (and often winning) for equal time in the classroom and public forum. The articles in issues XII and XIII were excellent and addressed many issues, but a great deal more needs to be dealt with, including for instance, the inerrancy doctrine that underlies much of creationist philosophy.

Thank you again for your time and effort, and for your excellent periodical.

Scott Church

Rabbi Greenspahn's report on recent biblical scholarship gives the impression that the main effort Jewish scholars are intent on is justifying their claims to eternal verities against those of Christian scholars and that at best they are seeking areas of common ground, but not necessarily objective, believable truth.

"The question," he says, "is not whether the Bible is true or false, but rather, what kind of truth it seeks to convey." I would like to suggest, rather, that the question is whether the Bible is of "divine" or fallible mortal origin, and what its inconsistencies, contradictions, errors, omissions and absurdities indicate about the author(s) and what kind of truth *they* were trying to convey.

Sophistical and talmudical efforts to explain away the untenable can, if extrapolated, have us take the *Iliad* and *Odyssey* as gospel. And, I ask, "Why not, indeed?"

The idea that his fellow scholars and he are now in a position to reiterate the main theses with which they began (whatever these were), and that new conclusions are in no way threatening their religious faith, makes it appear that, like Omar Khayam, "they went out the self-same door through which they came." True faith facing new facts and remaining untouched appears to be a feat of doggedness.

Nevertheless, some concession to reality is noted in his statement: ". . . its [the Bible's] descriptions of creation must be understood in light of the differing points of view which were prevalent in its own time." If we keep in mind that "its

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own time" was the Bronze Age, we can perhaps ask ourselves how long we ought to continue to be imposed upon by these quaint, pre-literate notions, very few of which are relevant to our own, evolved, society.

Dorothy S. Klein

Mr. Sillman's letter in the last issue (no. XIII) regarding his discovery of a Nihil Obstat and Imprimatur in an Australian creationist paperback is surprising but should not be alarming. The Catholic Church certainly does not endorse creationism. This is clearly attested by reference to the concluding statement of the historic conference of paleontologists, geneticists, and molecular biologists which met from May 24th to May 27th, 1982, at the Pontifical Academy of Sciences in the Vatican Gardens. After working together under the direction of Carlos Chagas, Brazilian neurophysiologist and scientific advisor to Pope John Paul II, the group concluded that:

> "We freely acknowledge that there is room for differences of opinion on such problems as species formation and the mechanisms of evolutionary change. Nevertheless, we are convinced that masses of evidence render the application of the concept of evolution to man and other primates beyond serious dispute."

Also, see the article concerning this conference in the Sept./Oct., 1982 issue of *Oceans* (p. 72). Finally, at least since 1977, the Catholic Almanac, published by Our Sunday Visitor, Inc., has included statements within the glossary explanation of evolution which emphasize the confirmation of evolution through scientific evidence while maintaining the doctrine of special creation of the human *soul*. (p. 362, 1977 ed.)

The Nihil Obstat ("Nothing stands in the way") is issued by the church censor and merely states that nothing contained within the text is explicitly inimical or in violation of Catholic teaching. The Imprimatur ("Let it be printed") is issued by the bishop as an authorization. The unfortunate thing about these seals is that they are easily taken as an approval. They should in no way be interpreted as an endorsement whether in regards to the author's viewpoint or his manner of handling his subject.

The important thing to remember as far as the Catholic Church is concerned with evolution is the distinction between body and soul. Officially, the immediate creation of the human soul by God is a point of doctrine not open to question. The body, on the other hand, . . .

David J. Walling

This is in response to Jonathan Young's letter in Issue XIII in which he argues that I redefine "catastrophist." I redefine nothing. Early in the 19th century, when the science of geology was in its infancy, the

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words "diluvialist," "catastrophist," and "uniformitarian" had reasonably well-defined meanings. As I pointed out in my article, the diluvialist school, whose most important members were Adam Sedgwick and William Buckland, quickly went the way of the dodo, abandoned even by its founders. In the strictest sense, so did 19th century uniformitarianism and catastrophism.

Science evolves. When we call modern geologists uniformitarians we do not mean that they hold the same views as their 19th century predecessors. We mean that they carry on the scientific tradition founded by 19th century uniformitarians. While the uniformitarian tradition has largely triumphed, there have always been geologists like Derek Ager who maintained that violent events played an important part in geologic history. Ager is a catastrophist in much the same sense that most modern geologists are uniformitarians.

But the 19th century diluvialists, catastrophists, and uniformitarians were subjected to vociferous and sometimes vitrioloc criticism by another group, the "Scriptural" or "Mosaic" geologists. This latter tradition is yet alive, and as well as it ever was. Unlike modern uniformitarianism and catastrophism, the tradition of Scriptural Geology has hardly evolved at all. Modern scientific creationism is still based on a literal interpretation of the King James Bible.

Words, like scientific traditions, evolve. Today "catastrophism" is sometimes used in a broad, nonhistorical sense which might include Henry Morris's Flood Geology. But when creationists try to equate this modern usage with the historical meaning, it is a bit like arguing that orthodox geologists belong to the Greek Orthodox Church. I will let readers judge whether their equivocation proceeds from ignorance or guile.

Robert Schadewald

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News Briefs

California

Through most of 1983, Kelly Segraves, who heads the Creation-Science Research Center, fought a losing battle against the San Diego Public Schools. But his efforts give an indication of how he will likely proceed beginning in the Fall of 1984.

Segraves' first action in his recent battle was to write a letter of complaint to the principal of Serra High School in San Diego, where his son Kasey was enrolled in an advanced biology class. His complaint concerned the use in the class of Helena Curtis' highly regarded textbook, *Biology*. Segraves claimed it dogmatically supported evolution and was therefore in violation of California law. Segraves added statements that continued use of the book could result in "teacher dismissal" and loss of state funding. Segraves also complained about the showing of the PBS *Life on Earth* program in the same class and said that "a full investigation of this offense has been requested of the Department of Education in Washington, D.C. and a congressional investigation on the Federal level is already in progress."

When Segraves got no satisfaction from the principal, he went to the school board with a 38-page complaint detailing 217 quotations from the Curtis book that Segraves declared show "dogma, bias, error, or unacceptable references to religion." At a crucial school board meeting, Dr. William Thwaites, among others, defended the Curtis book and the teaching of evolution. The Committee of Correspondence was very active in this fight. As a result, the board voted 3-0 against Segraves. In response, Segraves left the room looking jubilant, as if this meant an opportunity to appeal.

And in a sense he did appeal. He wrote a letter to Bill Honig, State Superintendent of Public Instruction, requesting a hearing on the San Diego School Board's refusal to remove the Curtis book. In a later letter he asked Honig to "withhold all State funds from the San Diego School District until this violation has been eliminated." Honig, however, did no such thing. The response Segraves received from the California Department of Education informed him that the law he had cited for withholding state funds had been repealed in 1968, that the Curtis book was not "dogmatic" under state law, and that the San Diego School Board had handled the matter properly.

Other letters to other state and federal officials also failed to bring Segraves satisfaction and his requests for a public hearing were denied. The last

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chance Segraves will have to involve his son Kasey in these public school actions will be the 1984-85 school year when Kasey will be a high school senior.

Iowa

For 14 years, Harry Bert Wagoner, Jr. of Des Moines has been waging war against evolution and losing. His losses have included nine unsuccessful bids for a seat on the Des Moines School Board. His effort in 1983 was his latest but he shows little sign of admitting defeat.

Wagoner began his most recent effort by drawing up a list of 18 creationist books he wanted included in Iowa school libraries and classrooms. He then held meetings throughout the state to get creationist parents to sign petitions demanding that the books be purchased by local schools. Of the 60 school districts in the state, our records show that he succeeded in only two, and the books were placed only in libraries used by teachers. All the other schools rejected or ignored the petitions. To make matters worse for Wagoner, the State Attorney General ruled that the petitions were an illegal procedure.

To beef up his efforts, Wagoner arranged to have Henry Morris come to Iowa to give a series of lectures at fundamentalist churches. Ministers of mainline churches responded with letters and sermons in opposition to Morris and at each of Morris' lectures there were people who opposed his views. The lecture tour resulted in no new school adoptions of the list of books.

As a next move, Wagoner brought a complaint before the Iowa Civil Rights Commission against the Iowa Academy of Science for discriminating against his religion by opposing his efforts to introduce creationist literature into the public schools. He also leveled a similar complaint against the Des Moines school district for not stocking the books. But the Civil Rights Commission threw out his complaints.

Wagoner's line of argument was that creationism is a religion and it is discrimination against his religion to teach only the religion of humanism by teaching evolution alone in public schools. He also argued that evolution was inhibiting the free exercise of religion of creationist students. Wagoner wanted the teaching certificates revoked of teachers who taught evolution without creationism. Such a line of argument has been declared by Jack Novik of the ACLU to be a "sure loser" in any court.

To complete Wagoner's defeat, the National Center for Science Education published *Reviews of Thirty-One Creationist Books*, edited by Stan Weinberg (see advertisement, this issue). This book of reviews criticizes the leading creationist books that were on Wagoner's list. The book of reviews was distributed free to education agencies throughout Iowa. News publicity over Wagoner's

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objection to the reviews increased the demand for Weinberg's book. As a result, Iowa schools are now in a better position to judge whether they are interested in the books Wagoner proposed, and if they are, they will know to shelve them under "religion."

What Wagoner's next effort will be cannot be predicted.

Louisiana

After a U.S. District Court judge ruled against the Louisiana "two model" creationism law on the grounds that the Louisiana State Legislature cannot meddle with the public school curriculum, the creationists appealed the case to the Louisiana State Supreme Court. There the judges ruled on October 17, 1983, in a 4-3 decision, that the State Legislature had not usurped the power of the state's Board of Elementary and Secondary Education by establishing curriculum themselves. Thus the court upheld the Legislature's right to order public schools to teach creationism and pass the "two model" law. Though this was a victory for the creationists, the state court did not address the issue of whether the creationism law violated church-state separation. That issue will be dealt with in the U.S. District court, where the case has been referred once again.

The ACLU hopes the U.S. District Court will issue a summary judgment against the creationism law based on the Arkansas ruling. This would avoid a costly trial of the type that took place in Arkansas and in which the ACLU secured nearly $400,000 in legal fees and court costs from that state. If the ACLU won and collected a similar amount in Louisiana, that would be costs the state would have to pay over and above the state's own court costs, which have added up to over $100,000 at this time and would total $400,000 by the time the trial was over. Still, if the ACLU's motion for summary judgement is rejected, then the full blown court battle and media event still won't take place until the end of 1984 or the beginning of 1985, according to predictions by the Louisiana ACLU.

Incidently, the author of the Louisiana creationism law, Bill Keith, no longer sits in the State Senate. He was defeated in the November, 1983 election by his opponent, black Shreveport City Councilman Greg Tarver. Nonetheless, Keith remains active as president of the Louisiana chapter of the Creation Science Legal Defense Fund.

Texas

With all the battles in Texas over Mel and Norma Gabler and the Texas State

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Board of Education's anti-evolution rules, it is no surprise to those opposing creationism that Texas scored mostly below the national average in a recent wide-ranging U.S. Department of Education report card on public education. For example, Texas was rated only above Nevada in the percentage of its wealth that is channelled into education. All other states showed a higher percentage of their wealth devoted to schools. Texas came out below average in college entrance exam scores and high school graduation rate as well. This U.S. Department of Education report has gotten many in Texas to take a fresh look at their educational system and its shortcomings and could lead to far-reaching changes.

The Underground Battle

With the failure of "two-model" creationism laws in at least 24 states in recent years, and the devastating court defeat in Arkansas in 1982 of the creationism law passed there, creationists have begun to shift their tactics. They are going from highly-visible legislation and lawsuits to quiet teaching of creationism in schools, legal or not. Creationist teachers are organizing in an effort to further this goal, and have formed the National Association of Christian Educators as part of their campaign. Cases of teachers teaching creationism on their own have surfaced in Michigan, Wisconsin, California, New York, and elsewhere. The Committees of Correspondence and the ACLU are keeping a close eye on these incidents and have taken action when clear evidence has existed.

Probably the greatest concentration of clandestine teaching of creationism is taking place in the Santa Clara Valley and San Francisco Bay Area of California. Creationist efforts have been pinpointed in Livermore, San Jose, Golroy, and Oakland. To beef up their efforts, creationists in these areas have continued to bring in speakers from the Institute for Creation Research to speak at local churches and in the media.

It should, then, seem quite natural that the national headquarters for the fundamentalist National Association of Christian Educators is located in California. This organization, which is expanding nationwide, is very up-front about its aims. In promoting a November 1983 seminar called "Public Schools in Crisis," Norma Schilling, president of the Santa Clara Valley chapter of NACE, declared in a letter that Bob Simonds, the national president, would "present written materials which you can use in our local classrooms and School Boards." She said he has a plan "to get creation science into our classrooms and humanism out!" and referred to his manual *Communicating the Christian World View in the Classroom*. She also noted that Richard Bliss would speak at the second half of the seminar teaching the two-model ap-

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proach. "Get materials you can use in all classes," she said. "Learn of the national upheaval in scientific organizations over the Creation theory of origins. Evolution is on its way out. A new standard (Christ's) is making its impact! Every Christian educator should be a part of this."

This makes it clear that the "two-model" approach is just a step in the direction of creationism being taught alone. In a December 1983 letter from Bob and Jacki Simonds, the national leaders, the overall aims of NACE were brought out.

> We have now begun our campaign to start a Christian parents' organization called "Citizens for Excellence in Education." Our goal is to have committees in all 16,000 school districts in America. We can totally change our schools through these parent groups who will influence all our school boards and bring back *our* Christian values and morality, and a national faith in God. (Emphasis added.)

Their program includes bringing fundamentalist values into all courses of instruction.

Internationally

In Alberta, Canada, religion is often mixed with education to the point that in many publicly financed grade schools creationism is taught side-by-side with evolution in history and science courses. In Ontario, Canada, creationists have been writing letters to the Ministry of Education to get more creationism taught in that province. And, perhaps most significantly, Baird Judson, a geology professor at the University of P.E.I., is the one public college professor in Canada who is actually teaching creationism in his courses. Judson's introductory geology class is required for engineering students, but not science students, at the university.

A controversy over evolution has erputed in Israel's public schools. Creationists there, who have taken the arguments of American creationists almost verbatim, are demanding the "two-model" approach. Since they are having some success in their efforts, some parents opposed to creationism plan to take the case to Israel's Supreme Court. Israeli creationists tend to be moderately Orthodox Jews or passionate new converts to Orthodoxy.

W. F. Harris, a professor in the Department of Chemical Engineering at the University of the Witwatersrand in Johannesburg, South Africa, had this to say.

> If you think creationism a problem in your country perhaps you might take some consolation from the fact that it is nowhere as bad as it is in mine. Evolution is taught in no schools below the level of university. Indeed the stated aim of high school biology courses is to teach the "wonder of Creation." In Sagan's *Cosmos* carried on national television, Carl's voice was blanked out each time he implied that evolution was a fact!

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This is the last installment of the "News Briefs" column. From now on, if you wish to keep up to date on news events in the creation-evolution controversy, you should subscribe to the comprehensive *Creation/Evolution Newsletter* published by the National Center for Science Education. (See advertisement this issue.)

CONTRIBUTE TO THE EVOLUTION/CREATION ARCHIVE

The Department of Special Collections of the Iowa State University Library has established an archive containing both published and unpublished materials relating to all aspects of the continuing dialogue between proponents of evolution and special creation. Materials deposited here are treated like other archival items. That is, they will be processed, indexed, and preserved according to standard archival procedures and will be available to any qualified researchers.

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To present materials to the Archive or to ask for more information, write to: **Dr. Stanley Yates**, Department of Special Collections, Iowa State University Library, Ames, IA 50011; or call (515) 294-6672.

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National Center for Science Education

Edited by Stan Weinberg

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Because news about the creation-evolution controversy is expanding, a regular newsletter, issued bimonthly, has become a necessity. This is why the National Center for Science Education (which helps coordinate the Committees of Correspondence on this controversy) has converted its *Memorandum to Committees of Correspondence* into the more formal and regular *Creation/Evolution Newsletter*.

Now you will be able to get the latest news, timely and in detail. The editor of the *Newsletter* is Dr. Karl Fezer, professor of biology at Concord College, Athens, WV 24712. The first issue is scheduled for publication in late February 1984 (being Volume 4, Number 1, of the former *Memorandum*). All subscribers to *Creation/Evolution* journal will automatically receive this issue free!

The *Creation/Evolution Newsletter* will take over the "News Briefs" column in the *Creation/Evolution* journal, thereby allowing the journal to totally devote its pages to articles and features.

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